Test Report for the Gateway Energy and Coke Company Facility ID 119040ATN HRSG Bypass Vent Stack No. 5

Prepared for: Gateway Energy and Coke Company Granite City, Illinois

Prepared by: AECOM Oak Ridge, Tennessee

**July 2017** 





July 7, 2017

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RE: Consent Decree, *United States, et al. v. Gateway Energy & Coke Company LLC, et al.*Stack Testing Report for GECC May 2017 Stack Testing
Haverhill Coke Company, LLC Facility (Ohio EPA Facility ID 0773000182)

To Whom It May Concern,

The United States, the State of Illinois, the State of Ohio, Gateway Energy & Coke Company, LLC (GECC), Haverhill Coke Company, LLC (HNCC) and SunCoke Energy, Inc. (SunCoke) are parties to a Consent Decree (CD) lodged in the U.S. District Court for the Southern District of Illinois with an Effective Date of November 7, 2014.

In accordance with Paragraphs 29, 30, and 33 of the CD, HNCC and GECC are required to conduct stack testing during any Scheduled FGD Maintenance that lasts more than 2 days and a report documenting the results of the stack test must be submitted no later than 60 days after conducting the stack test. GECC conducted stack testing pursuant to Paragraphs 29 and 30 on May 3-12, 2017, during Scheduled FGD Maintenance. Attached, please find the report documenting the stack test results.



Please contact me at 740-355-9871 or  $\underline{kmbatten@suncoke.com}$  if you have any questions or concerns.

Sincerely,



Katie Batten Director of Environmental SunCoke Energy, Inc.

# TEST REPORT FOR THE GATEWAY ENERGY AND COKE COMPANY FACILITY ID 119040ATN HRSG BYPASS VENT STACK No. 5

Test Dates: May 3-12, 2017

Prepared for:

Gateway Energy and Coke Company 2585 Edwardsville Road Granite City, IL 62040

Prepared by:

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#### **Plant Name and Address**

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#### **Source Identification**

Facility ID – 119040ATN Stack Test – Bypass Vent Stack No. 5

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#### LIST OF ACRONYMS

CD Consent Decree

CEM Continuous Emissions Monitoring

CFR Code of Federal Regulations

CO<sub>2</sub> Carbon Dioxide

CTM Conditional Test Method

FGD Flue Gas Desulfurization

GECC Gateway Energy & Coke Company

H<sub>2</sub>O<sub>2</sub> Hydrogen Peroxide

H<sub>2</sub>SO<sub>4</sub> Sulfuric Acid Mist

HCl Hydrogen Chloride

HNO<sub>3</sub> Nitric Acid

HRSG Heat Recovery Steam Generator

KMnO<sub>4</sub> Potassium Permanganate

NOx Nitrogen Oxides

O<sub>2</sub> Oxygen

PM Particulate Matter

PM<sub>10</sub> Particulate Matter less than 10 microns diameter

SO<sub>2</sub> Sulfur Dioxide

USEPA United States Environmental Protection Agency

#### 1. INTRODUCTION/OVERVIEW

Gateway Energy & Coke Company (GECC) operates a 120 oven heat recovery coking facility in Granite City, Illinois. A series of stack tests were performed at GECC on Bypass Vent Stack No. 5 over the period of May 3 through May 12, 2017. These tests were performed to collect information required by a Consent Decree (CD) and by the United States Environmental Protection Agency (USEPA) as part of an information collection request. This report documents the results of a portion of the testing – the tests performed to satisfy the CD.

SunCoke Energy, Inc.; Haverhill North Coke Company; and GECC (collectively, SunCoke) entered into a CD with the United States and the states of Ohio and Illinois to resolve alleged Clean Air Act violations. This CD became effective on November 7, 2014. Paragraph 29 of the CD requires stack testing of one of the bypass vent stacks at GECC during flue gas desulfurization (FGD) system maintenance that is scheduled to last more than 2 days. GECC performed FGD maintenance beginning May 1, 2017, for a period of 28 days and performed the required tests on Bypass Vent Stack No. 5. GECC previously submitted a test protocol to USEPA and Illinois EPA of the FGD on February 27, 2017. Paragraph 33 of the CD requires submission of a report documenting the results of the test by no later than 60 days after the test. This report satisfies that requirement.

Table 1 shows the test results compared to CD limits.

**Table 1. Bypass Vent Stack Test Results** 

Pollutant	CD Limit	Test Result	Comply with CD limit?
Total PM/PM <sub>10</sub> (filterable plus condensable –	34.3	12.7	Yes
pounds/hour)			
Lead (pounds/hour)	0.186	0.075	Yes
Mercury (pounds/hour)	NA	0.0023	NA
NO <sub>x</sub> (pounds/hour)	NA	13.1	NA
Hydrogen chloride (pounds/hour)	NA	25.2	NA
Sulfuric acid mist (pounds/hour)	NA	19.3	NA

The remainder of this report contains CD requirements (Section 2), test results (Section 3), test methods (Section 4), sample train diagrams (Appendix A), production data (Appendix B), calculations and field data (Appendix C), analytical reports (Appendix D), and calibration information (Appendix E).

# 2. CONSENT DECREE TEST REQUIREMENTS

The CD requires that a series of tests be performed during periods of FGD maintenance scheduled to last more than 2 days. These tests were performed May 5-6, 2017 and May 8-9, 2017. The measured pollutants were:

- Particulate matter (PM) and particulate matter less than 10 microns diameter (PM<sub>10</sub>)
- Lead
- Mercury
- Hydrogen chloride (HCl)
- Sulfuric acid mist (H<sub>2</sub>SO<sub>4</sub>)
- Nitrogen oxides (NO<sub>x</sub>)

#### 3. STACK TEST RESULTS

The bypass vent stacks at GECC were opened to begin FGD maintenance on May 1, 2017. The stack tests for the CD started May 5, 2017, at approximately 15:00 and were completed on May 9, 2017, at approximately 18:00. Paragraph 19 of the CD requires that emissions be minimized during all bypass venting. This includes restrictions on the maximum average coal charge (an average 42.5 tons/oven for the facility) and the maximum coal sulfur content (allowed up to 1.1%). The coal charge tonnage was near the maximum allowed and the coal sulfur was representative:

- Coal charge during all tests: no more than 42.5 tons per oven on average
- Coal sulfur during tests: 0.86% to 0.88% by weight

The coal charge to each oven is measured by a calibrated weigh bin, which batches each coal charge prior to charging it to the oven. During the test, GECC complied with the CD requirement for emissions minimization, which requires a maximum of 42.5 tons on average charged per oven and a maximum coal sulfur of 1.1%. The date and amount of coal charged to each oven under Bypass Vent Stack No. 5 during the tests are shown in Appendix B. The coal sulfur analysis during the tests is also included in Appendix B.

The 120 ovens at GECC operate on a 48-hour coking cycle. Half the ovens are pushed and charged each day. For example, the 60 odd-numbered ovens are pushed and charged one day and the 60 even-numbered ovens are pushed and charged the next. There are two production runs per day; approximately one-fourth of the ovens are pushed and charged during each production run. Production at GECC occurs from approximately 19:00 in the evening until 04:00 the next morning.

As requested by USEPA, one test run was performed during pushing and charging (conducted during the first pass on the heat recovery steam generator [HRSG] Stack No. 5 ovens). Pushing and charging requires approximately 8 to 9 hours each day. Typically no pushing and charging occurs during the other 15 to 16 hours of the day. The average daily

emissions rates are based on performing one run during pushing and charging and two test runs in the mid to late parts of the production cycle where there is no pushing and charging.

The stack tests for HCl, H<sub>2</sub>SO<sub>4</sub>, and NO<sub>x</sub> were performed on May 5 and 6. One test run was performed during the first production run on May 5. The information for the individual test runs and the average results are presented in Table 2. The stack tests for particulate matter, lead, and mercury were performed on May 8 and 9. One test run was performed during the first production run on May 8. The information for the individual test runs and the average results are presented in Table 3.

Table 2. HRSG Bypass Vent Stack No. 5 Test Results for HCl,  $H_2SO_4,$  and  $NO_x$ 

Information Type	Parameters				Average
	Run No.	1	2	3	
	Date	5/5/2017	5/5/2007	5/6/2007	
All sampling	Test During Production?	No	Yes	No	
trains	Average charge/oven (wet tons coal)		42.2		
	O2 (%)	9.7	7.7	11.7	9.7
	CO2 (%)	7.0	8.5	5.5	7.0
	Run times	15:26-17:05	19:30-21:11	13:22-14:58	
	Sample time (minutes)	72	72	72	72
	Volume sampled (dscf)	44.01	43.79	49.73	45.85
	Moisture content (%Vol.)	10.0	10.1	10.3	10.1
HCl	Stack Gas Temperature (°F)	1,402	1,517	1,303	1,407
IICI	Stack Velocity (ft/sec.)	52.2	54.1	55.7	54.0
	Gas Flow Rate (ACFM)	199,250	206,413	212,791	206,152
	Gas Flow Rate (SCFM)	55,456	54,103	62,445	57,334
	Gas Flow Rate (DSCFM)	49,898	48,646	56,009	51,518
	Percent Isokinetic	102	104	102	103
	Run times	16:50-17:50	19:30-20:30	13:22-14:22	
H2SO4	Sample time (minutes)	60	60	60	
	Volume sampled (dscf)	18.9	18.7	18.4	18.7
	HCl concentration (ppm)	88	83	88	86
	HCl mass rate (pounds/hr)	24.9	22.9	27.9	25.2
Emissions	H2SO4 concentration (ppm)	32.8	21.9	19.3	24.7
Emissions	H2SO4 mass rate (pounds/hr)	25.0	16.3	16.5	19.3
	NOx concentration (ppm)	34.6	49.3	24.0	36.0
	NOx emission rate (pounds/hr)	12.4	17.2	9.7	13.1

Table 3. HRSG Bypass Vent Stack No. 5 Test Results for  $PM/PM_{10}$ , Lead, and Mercury

Information	Parameters				Average
Type	** ** *** ***				Average
	Run No.	1	2	3	
	Date	5/8/2017	5/8/2017	5/9/2017	
All sampling	Test During Production?	No	Yes	No	
trains	Average charge/oven (wet tons coal)		42.3		
	O2 (%)	11.7	11.7	11.8	11.7
	CO2 (%)	5.5	5.1	5.1	5.2
	Run times	13:25-17:49	21:25-01:07	14:38-18:01	
	Sample time (minutes)	120	120	120	120
	Volume sampled (dscf)	78.03	79.00	77.44	78.2
	Moisture Content (% Vol.)	8.2	8.7	11.1	9.3
DM 4/DM 410	Percent Isokinetic	100.3	100.4	102.1	101
PM/PM10	Stack Gas Temperature (°F)	1,291	1,359	1,327	1,325
	Stack Velocity (ft/sec.)	51.5	54.6	53.2	53.1
	Gas Flow Rate (ACFM)	196,515	208,568	202,966	202,683
	Gas Flow Rate (SCFM)	58,564	59,601	58,978	59,048
	Gas Flow Rate (DSCFM)	53,768	54,410	52,414	53,531
	Run times	13:25-17:49	21:25-01:07	14:38-18:01	
	Sample time (minutes)	120	120	120	120
	Volume sampled (dscf)	78.3	73.7	81.5	77.8
	Moisture Content (% Vol.)	10.5	12.3	11.1	11.3
M-4-1-	Percent Isokinetic	102.9	104.3	103.2	104
Metals	Stack Gas Temperature (°F)	1,275	1,353	1,322	1,317
	Stack Velocity (ft/sec.)	51.2	50.9	55.2	52.4
	Gas Flow Rate (ACFM)	195,344	194,177	210,545	200,022
	Gas Flow Rate (SCFM)	58,738	55,662	61,339	58,580
	Gas Flow Rate (DSCFM)	52,549	48,825	54,538	51,971
	Concentration total PM/PM10 (gr/dscf)	0.025	0.037	0.021	0.027
	Particulate Mass Rate (pounds/hr)				
	Filterable PM/PM10	3.9	11.1	5.0	6.7
E	Total PM/PM10 (filterable plus condensable)	11.4	17.3	9.3	12.7
Emissions	Lead concentration (ug/m3)	287	515	368	390
	Lead emission rate (lb/hour)	0.056	0.094	0.075	0.075
	Mercury concentration (ug/m3)	11.2	12.7	12.2	12.0
	Mercury emission rate (lb/hour)	0.0022	0.0023	0.0025	0.0023

#### 4. STACK TEST METHODS

The test methods are listed in Table 4. Each test was based on USEPA reference methods or alternative methods approved by USEPA.

**Table 4. Test Methods** 

<b>Emission Unit</b>	Pollutant	Test Method Reference	Comment
	Traverse point layout	USEPA Method 1	
	Gas flow rate	USEPA Method 2	
	Gas molecular weight	USEPA Method 3A	Measured O <sub>2</sub> and CO <sub>2</sub>
	Moisture	USEPA Method 4	
Bypass vent stack	PM/PM <sub>10</sub>	USEPA Method 5/202	
No. 5	NO <sub>x</sub>	USEPA Method 7E	
	$H_2SO_4$	USEPA Conditional Test	Controlled condensate method
		Method (CTM)-13	
	HC1	USEPA Method 26A	
	Lead and Mercury	USEPA Method 29	

This section contains a brief description of the sampling and analytical procedures for each method that was employed during the test program. Any deviations from the methods are also discussed.

### 4.1 Sampling Point Determination – USEPA Method 1

The number and location of the sampling or traverse points was determined according to the procedures outlined in USEPA Method 1. The sample location was inspected to ensure USEPA Method 1 criteria are met. All points were at least 1.0 inch from the stack wall, per Method 1. The bypass vent stack required a 24 point traverse for isokinetic sampling, which was spread evenly across two sampling ports.

#### 4.2 Flue Gas Velocity and Volumetric Flow Rate – USEPA Method 2

The flue gas velocity and volumetric flow rate were determined according to the procedures outlined in USEPA Method 2. Velocity measurements were made using S-type Pitot tubes that had been calibrated in a wind tunnel according to USEPA Method 2 criteria.

Differential pressures were measured with a fluid-inclined manometer. Flue gas temperatures were measured with Type K thermocouples equipped with digital readouts.

#### 4.3 Flue Gas Composition – USEPA Method 3A

Flue gas analysis for oxygen (O<sub>2</sub>) and carbon dioxide (CO<sub>2</sub>) concentrations to determine the flue gas dry molecular weight was performed in accordance with USEPA Method 3A directly utilizing continuous emissions monitors (CEMs) for each gas or by obtaining integrated samples that were then analyzed by CEMs for each gas. The concentrations of O<sub>2</sub> and CO<sub>2</sub> were reported in percent levels.

#### 4.4 Flue Gas Moisture Content – USEPA Method 4

The flue gas moisture content was determined in conjunction with each USEPA Method 5/202, Method 29, and Method 26A sampling trains and according to the sampling and analytical procedures outlined in USEPA Method 4. The impingers were connected in series and contained reagents as described in Section 4.5. The impingers were contained in an ice bath to ensure condensation of the moisture in the flue gas stream. Any moisture that was not condensed in the impingers was captured in the silica gel; therefore, all moisture was weighed and entered into moisture content calculations.

#### 4.5 $PM/PM_{10} - USEPA$ Methods 5/202

The CD requires testing for PM and PM<sub>10</sub>. PM consists of two components – filterable and condensable. It was not practicable to measure filterable PM<sub>10</sub> in the GECC bypass vent stacks because the temperature (over 1,600°F) was outside the range of the equipment typically used for Method 201A (400°F). Certain modifications to the method may be used to extend the range to 500°F. The equipment described in Method 201A cannot be used above this temperature without alternate construction techniques and the use of exotic materials (40 CFR 60, Appendix A, Method 201A, 8.6.1). In any event, Method 201A uses an in-stack filter after the cyclone,

which limits the temperature to approximately  $1,000^{\circ}$ F. Therefore,  $PM_{10}$  emissions were assumed to be the same as PM emissions.

The sampling probe was fitted with a calibrated, S-type Pitot for measuring exhaust gas flow rates and a K-type thermocouple for measuring the gas stream temperature. The absence of cyclonic flow was verified prior to performing the compliance tests.

The filterable PM was measured in accordance with USEPA Reference Method 5. The filterable PM was performed by extracting a sample of the stack exhaust gas stream through a one-piece quartz nozzle and liner encased in an air-cooled probe. The probe was attached to a heated, glass filter holder containing a pre-weighed, glass-fiber filter. The filter heater box was maintained at a temperature of 248°F +25°F as measured by a K-type thermocouple in the filter holder housing.

At the conclusion of each test run, the sample train was recovered by rinsing the sample probe and nozzle three times with acetone into a sample container. The filter was removed from the filter holder and placed into a Petri dish and sealed for transportation. The front half of the glass filter holder and connecting elbow were rinsed with acetone into the probe wash sample container. A sample of the acetone used in the sample recovery was collected and analyzed as a reagent blank. The acetone rinses and filters were analyzed for filterable PM.

The condensable fraction of PM was measured using the procedures described in USEPA Reference Method 202. The impinger train contained a water-jacketed coil condenser between the heated filter outlet and inlet to the first impinger. The water condensed in the coil condenser drops into a knockout impinger. The second impinger is initially empty. The cooled gas then passes through a Teflon filter maintained in the range of 65°F to 85°F. The third impinger initially contains 100 mL of distilled water. The fourth impinger contains approximately 200 grams of indicating silica gel. The third and fourth impingers are placed in an ice bath to maintain the impinger train outlet temperature at ≤65°F.

After testing, the impinger train was moved to the test trailer and connected to a cylinder of pure nitrogen and purged for 60 minutes at a flow rate of 14 liters per minute. The condenser, first two impingers, connecting glassware, and front-half of the Teflon filter holder were rinsed with water for the inorganic sample and with acetone followed by hexane for the organic sample. The Teflon filter, organic and inorganic rinses, and reagent blanks were analyzed for inorganic and organic condensable PM.

#### 4.6 HCl – USEPA Method 26A

The HCl sampling was performed using an USEPA Method 26A sampling train. The train consisted of a quartz liner fitted into an air-cooled sampling probe. This is required because the stack temperature was at least 1,600°F. The probe was connected to a heated, glass filter holder containing a quartz filter. The outlet of the filter holder was connected to a series of ball-joint impingers. The first and second impingers were the Greenburg-Smith type and each contained 100 mL of 0.1N sulfuric acid (H<sub>2</sub>SO<sub>4</sub>). The third impinger was a modified Greenburg-Smith impinger containing water. The fourth impinger was a modified Greenburg-Smith impinger containing 200 grams of indicating silica gel. Only the impingers that absorb HCl (the H<sub>2</sub>SO<sub>4</sub> impingers) were analyzed.

#### 4.7 H<sub>2</sub>SO<sub>4</sub> – Conditional Test Method 13 (CTM-13)

Conditional Test Method 13 (CTM-13) method, also known as NCASI Method 8A, was developed as an alternative to USEPA Method 8 for determining H<sub>2</sub>SO<sub>4</sub> emissions from Kraft recovery furnaces. It has been observed that the reference method, USEPA Method 8, can be subject to significant interference from sulfur dioxide (SO<sub>2</sub>) as well as sulfates if they are present in the PM. This alternative method uses a quartz in-line filter to remove PM from the gas stream prior to capturing H<sub>2</sub>SO<sub>4</sub>. The use of a controlled condensation technique instead of impingers reduces the potential for positive bias from SO<sub>2</sub>. This conditional test method was used because the expected sulfur trioxide concentration was small (less than 20 parts per million), and the alternate test method is likely to be more accurate in this situation.

The CTM-13 sampling train consisted of a quartz tube wrapped in an insulating blanket that was used as the sampling probe. The exit of the probe was connected to a filter holder containing a quartz filter, which was maintained at a temperature of 550°F by means of a cylindrical heating mantle. The outlet of the filter holder was connected to a modified Graham condenser that was constructed with a Type-C glass frit and 200 cm of 5-mm ID glass tubing condenser coil. The outer condenser chamber contained water maintained at a temperature ≤150°F by means of a recirculating water bath. The outlet of the heated coil condenser was connected to a series of glass impingers. The first impinger was a Greenburg-Smith filled with 100 mL of 3% hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>). The second impinger was a modified Greenburg-Smith also filled with 100 mL of 3% H<sub>2</sub>O<sub>2</sub>. The third impinger was a Greenburg-Smith filled with 100 mL of distilled water. The fourth impinger was a modified Greenburg-Smith filled with 200 grams of indicating silica gel. The sampling train was connected, by means of an umbilical cord, to the control console. The control console contained the dry gas meter, sampling pump, heat controllers, and sample rate controls.

The CTM-13 sample train was operated by placing the end of the quartz sample tube approximately 3 feet into the vent stack. A gas sample was then extracted from a single sampling point in the stack, at a constant sample rate of 10.0 L/min ( $\pm 10\%$ ), for a 1-hour period. Leak checks were performed at both the beginning and ending of a sample test run.

At the conclusion of the test run, the CTM-13 sample train was removed from the sampling platform and recovered in the test trailer. The sample recovery was performed by rinsing the H<sub>2</sub>SO<sub>4</sub> condenser with distilled water. The H<sub>2</sub>SO<sub>4</sub> condenser rinse was collected into sample containers. The impingers were discarded since they are designed to collect SO<sub>2</sub>, which was not a target pollutant for these tests. The H<sub>2</sub>SO<sub>4</sub> sample containers were then sealed at the site for subsequent analysis. The CTM-13 analysis was performed by suppressed ion chromatography.

#### 4.8 NO<sub>x</sub>/O<sub>2</sub>/CO<sub>2</sub> – USEPA Method 7E

During the May 5 and 6 tests, AECOM operated CEMs for NO<sub>x</sub> and O<sub>2</sub>/CO<sub>2</sub> according to USEPA Methods 7E and 3A, respectively. The CEM analyzers were calibrated before the start of testing. System bias checks were performed before and after each test run. The calibration and bias checks used USEPA protocol gases according to USEPA Method 7E and Method 3A guidelines. The gases were measured continuously, and an electronic data logger recorded 1-minute averages for the test runs.

The CEM sampling was performed by placing a sample probe in the stack to withdraw a continuous gas sample. The gas sample was transported through a heated, Teflon sample line to an electric gas chiller that removed moisture from the gas stream. Exiting the gas chiller, the dried sample gas was distributed to each CEM for subsequent analysis.

# 4.9 Lead and Mercury – USEPA Method 29

The lead and mercury sampling was performed using an USEPA Method 29 sampling train. The sample train consisted of an integrated quartz nozzle and probe liner fitted into an air-cooled sampling probe. This is required because the stack temperature was at least 1,600°F. The outlet of the probe was connected to a heated, glass filter holder containing a quartz fiber filter. The outlet of the filter holder was connected to a series of ball-joint impingers. The first impinger was a modified Greenburg-Smith containing 100 mL of a 5% nitric acid (HNO<sub>3</sub>)/10% H<sub>2</sub>O<sub>2</sub> mixture. The second impinger was a Greenburg-Smith containing a 5% HNO<sub>3</sub>/10% H<sub>2</sub>O<sub>2</sub> mixture. The third impinger was a modified Greenburg-Smith and was initially empty. The fourth and fifth impingers were modified Greenburg-Smith types containing a mixture of 4% potassium permanganate (KMnO<sub>4</sub>)/10% H<sub>2</sub>SO<sub>4</sub>. The sixth impinger was a modified Greenburg-Smith containing 200 grams of indicating silica gel. The remainder of the sampling train was identical to the previously described Method 5/202 train.

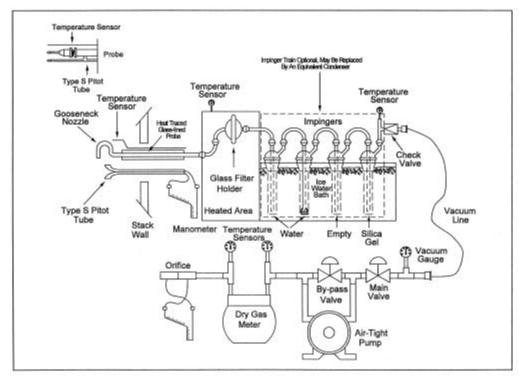
The Method 29 train was operated identically to the Method 5 train, except the total sample volume collected was at least 70 dry standard cubic feet to ensure adequate detection

limits of the target metals. At the conclusion of the sample run, the Method 29 sample train was removed from the stack to the sample recovery trailer for subsequent recovery per Method 29 procedures. The sample probe was washed on the stack to avoid potential breakage of the probe liner.

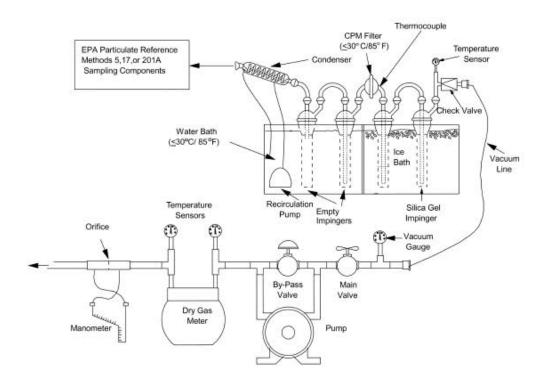
At the conclusion of each Method 29 test run, the sample train was recovered by washing the nozzle/probe assembly and front half of the filter holder three times with 0.1N HNO<sub>3</sub> into a sample container. The impinger train was then disassembled and each impinger weighed to determine the moisture gained during the sample run. The liquid contents of impingers one and two were transferred into a sample container along with the 0.1N HNO<sub>3</sub> rinse. Impinger three was also rinsed with 0.1N HNO<sub>3</sub>. The contents of impingers four and five were transferred into a sample container. The impingers were then rinsed with 100 mL of fresh KMnO<sub>4</sub> solution. The rinse was transferred to a separate sample container. The impingers were then rinsed with 100 mL of deionized water and added to the same sample container. A 25 mL rinse of 8N HNO<sub>3</sub> was performed and collected into a separate sample container. The silica gel in the last impinger was recovered for subsequent reconditioning.

Samples of the filter, deionized water, impinger solutions, and rinse solutions were collected along with the actual test samples to serve as blanks for the tests. The blank samples were analyzed along with the actual test samples.

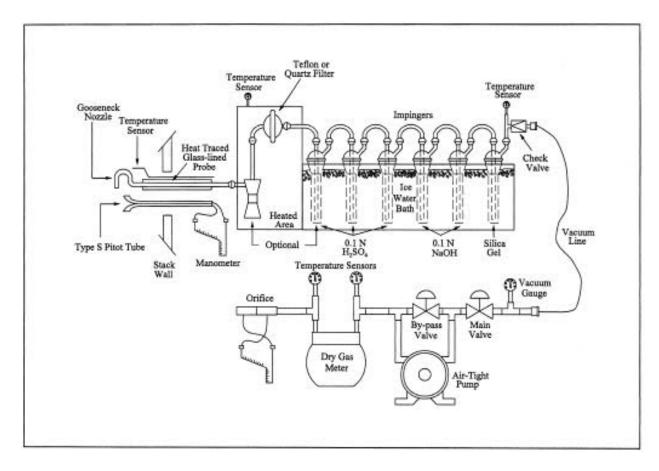
Appendix A
SAMPLE TRAIN DIAGRAMS



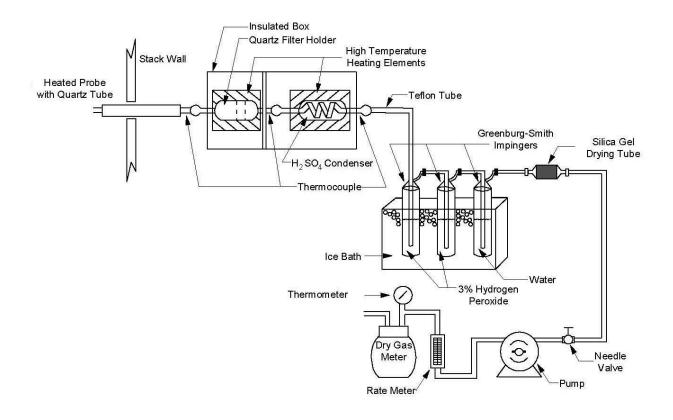
USEPA Method 5 Train (front portion)



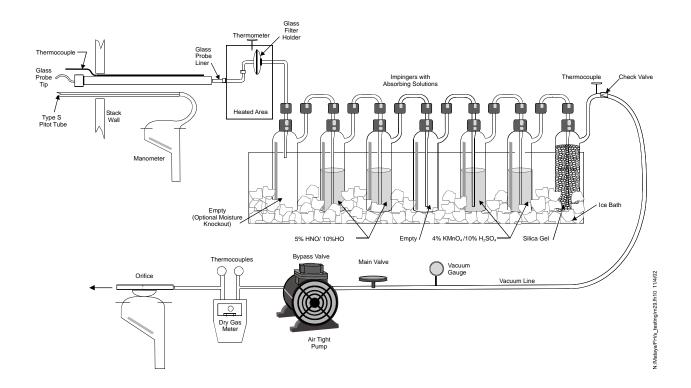
USEPA Method 202 Train (back portion)



USEPA Method 26A Train (no NaOH in back impingers)



USEPA Method CTM-13 Train



USEPA Method 29 Train

Appendix B PRODUCTION DATA

Coal Charge Tonnage During CD and ICR Tests Gateway Energy and Coke Company

5/11/2017		41.20	41.11			43.38	45.64			43.67	43.38			42.73	42.19			40.60	41.50	
5/10/2017	41.98			42.42	42.06			42.19	41.98			42.29	42.43			42.19	42.70			41.97
5/9/2017		42.20	42.17			41.97	42.10			42.14	42.14			42.30	42.19			41.90	41.95	
5/8/2017	43.11			42.42	42.68			42.19	42.41			42.29	42.03			42.89	41.74			42.25
5/7/2017		42.96	42.42			42.16	42.73			42.11	42.03			43.19	42.48			42.01	42.25	
5/6/2017	42.19			42.25	42.09			42.48	42.06			42.20	42.22			41.72	42.20			42.07
5/5/2017		45.54	42.27			42.09	43.03			42.22	42.13			42.29	42.23			42.29	42.23	
5/4/2017	42.27			42.26	41.69			41.74	43.27			42.09	42.17			42.09	42.22			42.16
5/3/2017		41.91	42.00			42.06	42.20			42.06	42.10			42.13	42.03			41.98	41.91	
5/2/2017	42.68			41.74	42.61			45.64	42.38			42.81	42.58			42.71	42.65			43.54
Oven number	81	82	83	84	85	98	87	88	89	06	91	92	93	94	95	96	97	98	66	100

Average during PM/PM10, lead, mercury tests Average during HCI, H2SO4, NOx tests

42.2 tons 42.3 tons

42.22

42.11

42.40

42.43

42.15

42.33

42.20

45.04

42.63

Average

# **Coal Sulfur During CD and ICR Tests**

Coal Composite 042917-050517 Coal Composite 050617-051217

0.86% 0.88%

Appendix C
CALCULATIONS AND FIELD DATA

GCO HCL and H2SO4

Project Name

Project Name				GC	HCL and H250	54			
Project Number Facility									
Sample Type	HCI	HCI	HCI	H2SO4	H2SO4	H2SO4	0	0	<del>r</del>
Source	BVS 5	BVS 5	0	0	A <sup>,</sup>				
Condition	Non P	Prod	Non P	Non P	Prod	Non P	0	0	
Run	1	2	3	1	2	3	0	0	
Date	5/5/2017	5/5/2007	5/6/2007	5/5/2017	5/5/2017	5/6/2017	1/0/1900	1/0/1900	
Time Start	15:26	19:30	13:22	16:50	19:30	13:22	00:00	00:00	
Time Stop	17:05	21:11	14:58	17:50	20:30	14:22	00:00	00:00	
Sampling Times	15:26-17:05	19:30-21:11	13:22-14:58	16:50-17:50	19:30-20:30	13:22-14:22	00:00-00:00	00:00-00:00	
Duct Diameter (ft) (equivalent if square duct)	9.00	9.00	9.00	0.00	0.00	0.00	0.00	0.00	
Pitot Tube Correction Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.00	0.00	
Nozzle Diameter (inches)	0.375	0.375	0.375	NA NA	NA NA	NA NA	0.000	0.000	
DGMCF (Y <sub>d</sub> )	0.971	0.971	0.971	0.981	0.981	0.981	0.000	0.000	
Orifice Factor ("wc) (ΔH <sub>@</sub> )	2.015	2.015	2.015	NA NA	NA NA	NA NA	0.000	0.000	
Console Identification	URS-001	URS-001	URS-001	URS-005	URS-005	URS-005	0.000	0.000	
Standard Temperature (°F)	68	68	68	68	68	68	68	68	
Barometric Pressure Measured ("Hg)	29.84	29.83	29.79	29.84	29.83	29.79	0.00	0.00	
Stack Elevation (ft) (relative to Barometer)	450	450	450	450	450	450	0.00	0.00	
Barometric Pressure ("Hg) (P <sub>b</sub> )	29.39	29.38	29.34	29.39	29.38	29.34	0	0	
Average Stack Temperature (°F)	1402.0	1516.5	1303.0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1
Average DGM Temp (°F)	96.3	97.0	105.5	98.4	101.4	106.7	#DIV/0!	#DIV/0!	1
Average Delta Η ("wc) (ΔΗ <sub>avg</sub> )	1.42	1.38	1.81	0.30	0.30	0.30	#DIV/0!	#DIV/0!	
Condensed Water (g)	103.8	104.0	121.0	0.0	0.0	0.0	0.0	0.0	
Test Duration (minutes) (O)	72	72	72	60	60	60	0	0	
Static Pressure ("wc)	-0.31	-0.31	-0.31	NA	NA	NA	0.00	0.00	
Carbon Monoxide (CO) Content (%)	0	0	0	0	0	0	0	0	
Carbon Dioxide (CO <sub>2</sub> ) Content (%)	7.00	8.50	5.50	7.00	8.50	5.50	0.00	0.00	
Oxygen (O2) Content (%)	9.70	7.70	11.70	9.70	7.70	11.70	0.00	0.00	
Hydrogen (H <sub>2</sub> ) Content (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Methane (CH <sub>4</sub> ) Content (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Nitrogen (N₂) Content (%)	83.30	83.80	82.80	83.30	83.80	82.80	100.00	100.00	
Meter Volume (dcf) (V <sub>m</sub> )	48.448	48.282	55.691	20.693	20.678	20.547	0.000	0.000	
Average square root of ΔP ((VΔP) <sub>avg</sub> )	0.492	0.496	0.538	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
Absolute Stack Pressure ("Hg)	29.37	29.36	29.32	29.39	29.38	29.34	0.00	0.00	
Absolute Stack Temperature (°R)	1862.0	1976.5	1763.0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	ı
Flue Gas Moisture (%)	10.02	10.08	10.31	0.00	0.00	0.00	#DIV/0!	#DIV/0!	
Moisture at saturation	N/A	N/A	N/A	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
Moisture used in Calculation	10.02	10.08	10.31	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
Gas Molecular Weight (Wet) (g/g-mole)	28.35	28.49	28.18	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
Corrected Vol of Gas Sample (dcf) (V <sub>m(actual)</sub> )	47.043	46.882	54.076	20.300	20.285	20.157	0.000	0.000	
Volume at Meter (dscf)	44.015	43.790	49.732	18.868	18.747	18.431	#DIV/0!	#DIV/0!	
Average Gas Velocity (ft/sec)	52.20	54.08	55.75	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
Avg Flow Rate (acfh)	11,955,022	12,384,782	12,767,483	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	12
Avg Flow Rate (acfm)	199,250	206,413	212,791	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2
Avg Flow Rate (scfh)	3,327,331	3,246,156	3,746,691	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	3,
Avg Flow Rate (scfm)	55,456	54,103	62,445	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1
Avg Flow Rate (dscfh)	2,993,893	2,918,782	3,360,552	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	3,
Avg Flow Rate (dscfm)	49,898	48,646	56,009	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	d.
Isokinetic Sampling Rate (%)	101.62	103.70	102.29	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	

#### Data Entry Area

Sample Type	HCI	Pitot Tube Correction Factor	0.83	Entered By (initials)	JC	
Source	BVS 5	Console ID	URS-001	Checked by (initials)	SB	ĺ
Condition	Non P	DGMCF	0.971	Corrected by (initials)		ı
Run	1	ΔH <sub>@</sub>	2.015			
Date	5-May	Nozzle Diameter (in)	0.3750	% CO	0	
Duct Diameter (ft)	9	Std Temp (°F)	68	% CO <sub>2</sub>	7	
Duct Depth (ft)		Bar Press ("Hg, meas)	29.84	% O <sub>2</sub>	9.7	
Duct Width (ft)		Meter Elev (ft) (rel to Brmtr)	450	% H <sub>2</sub>	0	
		Static Press ("H₂O)	-0.31	% CH₄	0	

Time	S	DGM Volu	umes (as read)		Impin	ger Catch (g)	
start	15:26	start	811.706		Initial	Final	
stop	16:02	stop	836.497	1	716.5	804.5	88
start	16:29	start	836.538	2	625.3	629.9	4.6
stop	17:05	stop	860.195	3	631.7	633.8	2.1
start		start		4	928.1	937.2	9.1
stop		stop		5			
start		start		6			
stop		stop		7			
start	W. I	start		8			
stop		stop		9			
start	- 1	start		10			
stop		stop					
start		start					
stop		stop					
start		start					
stop		stop					
start		start					
stop		stop					
						Total Wt Gain	103.8
Duration	72	Total	48.448				

	ΔP ("H <sub>2</sub> O)	ΔH ("H <sub>2</sub> O)	Stack Temp (°F)	DGM Temp (°F)	VΔP	√∆Н
Averages	0.24	1.42	1402	96.3	0.4920	1.1860
	80 8		0 0	5		
Individual	0,2800	1.70	1469	93	0.52915026	1.30384
Readings	0,2800	1.60	1468	94	0.52915026	1.264911
	0,2800	1.60	1463	94	0.52915026	1.264911
	0.2600	1.50	1464	96	0.50990195	1.224745
	0.2900	1.60	1458	97	0.53851648	1.264911
	0.2700	1.60	1450	97	0.51961524	1.264911
	0,2500	1.40	1420	98	0.5	1.183216
	0,2800	1.60	1401	99	0.52915026	1.264911
	0,2800	1.60	1410	99	0.52915026	1.264911
	0.2400	1.40	1395	100	0.48989795	1.183216
	0.2100	1.20	1383	100	0.45825757	1.095445
	0.1500	0.90	1274	100	0.38729833	0.948683
	0,2300	1.40	1397	93	0.47958315	1,183216
	0.2400	1_40	1423	94	0.48989795	1.183216
	0.2200	1:30	1424	94	0.46904158	1.140175
	0.2300	1,30	1413	94	0.47958315	1.140175
	0.2300	1.30	1415	94	0.47958315	1,140175
	0.2800	1,60	1412	95	0.52915026	1.264911
	0.2800	1.60	1385	95	0.52915026	1.264911
	0.2600	1.50	1362	97	0.50990195	1,224745
	0.2500	1.50	1366	97	0.5	1.224745
	0.2300	1.40	1361	97	0.47958315	1.183216
	0.1600	0.97	1318	97	0.4	0,984886
	0.1700	1.00	1318	97	0.41231056	1

#### Data Entry Area

Sample Type	HCI	Pitot Tube Correction Factor	0.83	Entered By (initials)	JC
Source	BVS 5	Console ID	URS-001	Checked by (initials)	SB
Condition	Prod	DGMCF	0.971	Corrected by (initials)	
Run	2	ΔH <sub>@</sub>	2.015		
Date	5-May	Nozzle Diameter (in)	0.3750	% CO	0
Duct Diameter (ft)	9	Std Temp (°F)	68	% CO <sub>2</sub>	8.5
Duct Depth (ft)		Bar Press ("Hg, meas)	29.83	% O <sub>2</sub>	7.7
Duct Width (ft)		Meter Elev (ft) (rel to Brmtr)	450	% H <sub>2</sub>	0
		Static Press ("H <sub>2</sub> O)	-0.31	% CH₄	0

Time	S	DGM Volu	mes (as read)		Impinger Catch (g)		
start	19:30	start	860.517		Initial	Final	
stop	20:06	stop	883.744	1	761.3	850.7	89.4
start	20:35	start	884.002	2	776.8	781.1	4.3
stop	21:11	stop	909.057	3	651.2	652.9	1.7
start		start		4	870.4	879.0	8.6
stop		stop		5			
start		start		6			
stop		stop		7			
start		start		8			
stop		stop		9			
start		start		10			
stop		stop					
start		start					
stop		stop					
start		start					
stop		stop					
start		start					
stop		stop					
						Total Wt Gain	104.0
Duration	72	Total	48.282				

	ΔР ("н₂0)	ΔH ("H₂O)	Stack Temp (°F)	DGM Temp (°F)	VΔP	√∆H
Averages	0.25	1.38	1517	97.0	0.4958	1.1689
Individual	0.1700	1.00	1374	97	0.41231056	1
Readings	0.1800	1.10	1387	97	0.42426407	1,04881
	0.1900	1.10	1403	97	0.43588989	1.04881
	0.2000	1,20	1422	98	0.4472136	1.09545
	0.2400	1.40	1455	98	0.48989795	1.18322
	0.2700	1.60	1478	99	0.51961524	1.26491
	0.3100	1.80	1505	100	0.55677644	1.34164
	0.2900	1.60	1509	100	0.53851648	1.26491
	0.2600	1.50	1519	100	0.50990195	1.22474
	0.2500	1.40	1546	101	0,5	1.18322
	0.1800	1.00	1449	101	0.42426407	1
	0.1300	0.75	1400	102	0.36055513	0.86603
	0.3000	1.80	1595	99	0.54772256	1.34164
	0.3000	1,60	1621	97	0.54772256	1.26491
	0.2800	1.50	1619	97	0.52915026	1.22474
	0.2700	1.40	1611	96	0.51961524	1.18322
	0,3100	1,60	1609	95	0.55677644	1.26491
	0.3100	1,60	1600	95	0.55677644	1.26491
	0.2900	1,50	1555	95	0.53851648	1.22474
	0.2800	1.50	1550	94	0.52915026	1.22474
	0.2700	1.50	1551	94	0.51961524	1.22474
	0.2600	1.40	1550	92	0.50990195	1.18322
l l	0.2500	1,30	1549	92	0.5	1.14018
	0.1800	0.98	1540	92	0.42426407	0.98995

#### Data Entry Area

Sample Type	HCI	Pitot Tube Correction Factor	0.83	Entered By (initials)	JC
Source	BVS 5	Console ID	URS-001	Checked by (initials)	SB
Condition	Non P	DGMCF	0.971	Corrected by (initials)	
Run	3	$\Delta H_{@}$	2.015		
Date	6-May	Nozzle Diameter (in)	0.3750	% CO	
Duct Diameter (ft)	9	Std Temp (°F)	68	% CO₂	5.5
Duct Depth (ft)		Bar Press ("Hg, meas)	29.79	% O₂	11.7
Duct Width (ft)		Meter Elev (ft) (rel to Brmtr)	450	% H₂	
Static Press ("H <sub>2</sub> O)			-0.31	% CH₄	

Time	S	DGM Volu	ımes (as read)	Impinger Catch (g)			
start	13:22	start	912.830		Initial	Final	
stop	13:58	stop	941.687	1	718.8	823.6	104.8
start	14:22	start	941.908	2	626.6	630.0	3.4
stop	14:58	stop	968.742	3	633.6	635.2	1.6
start		start		4	923.3	934.5	11.2
stop		stop		5			
start		start		6			
stop		stop		7			
start		start		8			
stop		stop		9			
start		start		10			
stop		stop					
start		start					
stop		stop					
start		start					
stop		stop					
start		start					
stop		stop					
						Total Wt Gain	121.0
Duration	72	Total	55.691				

	ΔP ("H <sub>2</sub> O)	ΔH ("H₂O)	Stack Temp (°F)	DGM Temp (°F)	VΔP	√∆H
Averages	0.29	1.81	1303	105.5	0.5378	1.3361
Individuał	0.3000	1.80	1217	100	0.54772256	1.341641
Readings	0.2900	1.90	1045	100	0.53851648	1.378405
	0.2700	1.90	1065	101	0.51961524	1.378405
	0.2900	2.10	1063	101	0.53851648	1.449138
	0.2900	2,10	1311	102	0.53851648	1.449138
	0.3200	2.00	1337	103	0.56568542	1.414214
	0.3600	2,20	1381	103	0.6	1.48324
	0.3800	2.30	1392	104	0.6164414	1.516575
	0.3500	2.00	1398	105	0.59160798	1.414214
	0,4000	2.30	1430	105	0.63245553	1.516575
	0.2900	1.60	1382	106	0.53851648	1.264911
	0.2000	1,10	1350	106	0.4472136	1.048809
	0.2900	1.70	1407	105	0.53851648	1.30384
	0.2800	1,70	1403	105	0.52915026	1.30384
	0.3400	2.00	1407	106	0.58309519	1.414214
	0.3900	2.30	1385	107	0.6244998	1.516575
	0.3000	1.80	1354	107	0,54772256	1,341641
	0.2700	1.60	1306	107	0.51961524	1.264911
	0.3100	1.90	1297	109	0.55677644	1.378405
	0.2900	1.80	1295	109	0.53851648	1.341641
	0.2500	1.60	1295	110	0.5	1.264911
	0,2600	1,60	1287	110	0.50990195	1.264911
	0.1800	1.20	1265	111	0.42426407	1,095445
	0.1300	0.85	1200	111	0.36055513	0.921954

% O<sub>2</sub>

 $\% H_2$ 

% CH₄

9.7

#### Sample Type H2SO4 Pitot Tube Correction Factor 0.83 Entered By (initials) JC Console ID URS-005 Checked by (initials) Source BVS 5 SB Condition Non P DGMCF 0.981 Corrected by (initials) Run 1 ΔH<sub>@</sub> NA % CO Date 5-May Nozzle Diameter (in) NA Duct Diameter (ft) Std Temp (°F) 68 % CO<sub>2</sub> 7

Bar Press ("Hg, meas) 29.84

Meter Elev (ft) (rel to Brmtr) 450 Static Press ("H<sub>2</sub>O) NA

**Data Entry Area** 

Duct Depth (ft)

Duct Width (ft)

Time	!S	DGM Volu	mes (as read)		Impinge	er Catch (g)	
start	16:50	start	486.462		Initial	Final	
stop	17:50	stop	507.155	1			
start		start		2			
stop		stop		3			
start		start		4			
stop		stop		5			
start		start		6			
stop		stop		7			
start		start		8			
stop		stop		9			
start		start		10			
stop		stop					
start		start					
stop		stop					
start		start					
stop		stop					
start		start					
stop		stop					
					To	otal Wt Gain	0.0
Duration	60	Total	20.693	li i			

	ΔP ("H <sub>2</sub> O)	ΔH ("H <sub>2</sub> O)	Stack Temp (°F)	DGM Temp (°F)	√∆P	√∆H
Averages	#DIV/0!	0.30	#DIV/0!	98.4	#DIV/0!	0.5477
Individual		0.30	NA	97		0.5477226
Readings		0.30		97		0.5477226
		0.30		97		0.5477226
		0.30		97		0.5477226
		0.30		98		0.5477226
		0.30		99		0,5477226
		0.30		100		0.5477226
		0.30		99		0.5477226
		0.30		99		0.5477226
		0.30		99		0.5477226
		0.30		99		0.5477226
		0.30		100		0.5477226

		Data Entry Area			
Sample Type	H2SO4	Pitot Tube Correction Factor	0.83	Entered By (initials)	JC
Source	BVS 5	Console ID	URS-005	Checked by (initials)	SB
Condition	Prod	DGMCF	0.981	Corrected by (initials)	
Run	2	∆H <sub>@</sub>	NA	-	
Date	5-May	Nozzle Diameter (in)	NA	% CO	
Duct Diameter (ft)		Std Temp (°F)	68	% CO₂	8.5
Duct Depth (ft)		Bar Press ("Hg, meas)	29.83	% O <sub>2</sub>	7.7
Duct Width (ft)		Meter Elev (ft) (rel to Brmtr)	450	% H₂	
		Static Press ("H₂O)	NA	% CH₄	

Time	s	DGM Volu	ırnes (as read)	Impinger Catch (g)			
start	19:30	start	507.908		Initial	Final	
stop	20:30	stop	528.586	1	19		
start		start		2			
stop		stop		3			
start		start		4			
stop		stop		5			
start		start		6			
stop		stop		7			
start		start		8			
stop	- 4	stop		9			
start		start		10			
stop		stop					
start		start					
stop		stop					
start		start					
stop		stop					
start		start					
stop		stop					
					To	otal Wt Gain	0.0
Duration	60	Total	20.678				

	ΔP ("H <sub>2</sub> O)	ΔH ("H₂O)	Stack Temp (°F)	DGM Temp (°F)	VΔP	VΔH
Averages	#DIV/0!	0.30	#DIV/0!	101.4	#DIV/0!	0.5477
	8 3					,
Individual		0,30	NA NA	99		0.54772
Readings		0,30		99		0.54772
		0,30		99		0.54772
		0.30		100		0,54772
		0.30		101		0.54772
		0.30		101		0.54772
		0.30		102		0.54772
		0,30		102		0.54772
		0.30		103		0.54772
		0.30		103		0.54772
		0.30		104		0.54772
		0,30		104		0.54772
				i i		
	1					

### Data Entry Area

Sample Type	H2SO4	Pitot Tube Correction Factor	0.83	Entered By (initials)	JC
Source	BVS 5	Console ID	URS-005	Checked by (initials)	SB
Condition	Non P	DGMCF	0.981	Corrected by (initials)	
Run	3	ΔH <sub>@</sub>	NA		
Date	6-May	Nozzle Diameter (in)	NA	% CO	
Duct Diameter (ft)		Std Temp (°F)	68	% CO₂	5.5
Duct Depth (ft)		Bar Press ("Hg, meas)	29.79	% O <sub>2</sub>	11.7
Duct Width (ft)		Meter Elev (ft) (rel to Brmtr)	450	% H <sub>2</sub>	
		Static Press ("H <sub>2</sub> O)	NA	% CH₄	

Time	S	DGM Volu	imes (as read)		Impine	ger Catch (g)	
start	13:22	start	529.305		Initial	Final	
stop	14:22	stop	549.852	1			
start		start		2			
stop		stop		3			
start		start		4			
stop		stop		5			
start		start		6			
stop		stop		7			
start		start		8			
stop		stop		9			
start		start		10			
stop		stop					
start		start					
stop		stop					
start		start					
stop		stop					
start		start					
stop		stop					
						Total Wt Gain	0.0
Duration	60	Total	20.547				

	ΔP ("H <sub>2</sub> O)	ΔH ("H₂O)	Stack Temp (°F)	DGM Temp (°F)	VΔP	V4
Averages	#DIV/0!	0.30	#DIV/0!	106.7	#DIV/0!	0.5

Individual Readings

#DIV/0!	0.30	#DIV/0!	106.7	#DIV/0!	0.5477
4					
	0.30		106		0.54772
	0.30		106		0.54772
	0.30		106		0.54772
	0.30		106		0.54772
	0.30		106		0.54772
	0.30		106		0.54772
	0.30		106		0.54772
	0.30		107		0.54772
	0.30		107		0.54772
	0.30		108		0,54772
	0.30		108		0.54772
	0.30		108		0.54772

### **HCI Results**

Parameter	Run 1	Run 2	Run 3
Sample volume (dscf)	44.01	43.79	49.73
Sample volume (dscm)	1.246	1.240	1.408
HCI in sample (ug)	166,000	156,000	187,000
Conc. (ug/ft3)	3,771	3,562	3,760
Conc. (ug/m3)	133,187	125,807	132,789
Molecular weight	36.5	36.5	36.5
Conc. (ppm)	87.8	82.9	87.5

### **H2SO4 Results**

Parameter	Run 1	Run 2	Run 3
Sample volume (dscf)	18.87	18.75	18.43
Sample volume (dscm)	0.534	0.531	0.522
H2SO4 in sample (ug)	71,500	47,400	41,000
Conc. (ug/ft3)	3789	2528	2225
Conc. (ug/m3)	133822	89287	78558
Molecular weight	98	98	98
Conc. (ppm)	32.8	21.9	19.3

Project Name				GC	O PM and Met	als			
Project Number				GC.	o i ivi alla ivieti	a13			
Facility									
Sample Type	PM	PM	PM	Metals	Metals	Metals	0	0	
Source	BVS 5	BVS 5	0	0	Averages				
Condition	Non P	Prod	Non P	Non P	Prod	Non P	0	0	
Run	1	2	3	1	2	3	0	0	
Date	5/8/2017	5/8/2017	5/9/2017	5/8/2017	5/8/2017	5/9/2017	1/0/1900	1/0/1900	
Time Start	13:25	21:25	14:38	13:25	21:25	14:38	00:00	00:00	
Time Stop	17:49	01:07	18:01	17:49	01:07	18:01	00:00	00:00	
Sampling Times	13:25-17:49	21:25-01:07	14:38-18:01	13:25-17:49	21:25-01:07	14:38-18:01	00:00-00:00	00:00-00:00	
Duct Diameter (ft) (equivalent if square duct)	9,00	9,00	9,00	9.00	9,00	9.00	0.00	0.00	
Pitot Tube Correction Factor	0,83	0.83	0.83	0.83	0.83	0,83	0.00	0,00	
Nozzle Diameter (inches)	0,375	0,375	0.375	0,375	0,375	0,375	0,000	0.000	
DGMCF (Y <sub>d</sub> )	0,971	0,971	0,971	0,981	0,981	0,981	0.000	0,000	
Orifice Factor ("wc) (ΔH <sub>@</sub> )	2,015	2,015	2.015	1,947	1.947	1.947	0.000	0.000	
Console Identification	URS-001	URS-001	URS-001	URS-005	URS-005	URS-005	0	0	
Standard Temperature (°F)	68	68	68	68	68	68	68	68	
Barometric Pressure Measured ("Hg)	30,03	29,92	29.89	30,03	29,92	29,89	0.00	0.00	1
Stack Elevation (ft) (relative to Barometer)	450	450	450	450	450	450	0	0	
Barometric Pressure ("Hg) (Pb)	29,58	29.47	29.44	29,58	29.47	29.44	0	0	
Average Stack Temperature (°F)	1290,5	1358.8	1326.8	1274.9	1353.1	1322.2	#DIV/0!	#DIV/0!	1321.0
Average DGM Temp (°F)	94.6	79.9	96.8	95.3	78.7	96.2	#DIV/01	#DIV/0!	~
Average Delta Η ("wc) (ΔΗ <sub>avg</sub> )	1.58	1.60	1.61	1.41	1,37	1,51	#DIV/0!	#DIV/0t	
Condensed Water (g)	147.4	159.6	205.4	195.2	218,5	215.1	0.0	0.0	
Test Duration (minutes) (⊙)	120	120	120	120	120	120	0	0	
Static Pressure ("wc)	-0.25	-0.25	-0.25	-0.25	-0,25	0,25	0.00	0.00	
Carbon Monoxide (CO) Content (%)	0	0	0	0	0	0	0	0	
Carbon Dioxide (CO₂) Content (%)	5.50	5.10	5,10	5,50	5,10	5.10	0.00	0.00	l.
Oxygen (O <sub>2</sub> ) Content (%)	11.70	11.70	11,80	11,70	11.70	11,80	0.00	0.00	
Hydrogen (H₂) Content (%)	0,0	0,0	0.0	0.0	0.0	0.0	0.0	0.0	II.
Methane (CH₄) Content (%)	0.0	0.0	0.0	0.0	0_0	0.0	0.0	0.0	
Nitrogen (N <sub>2</sub> ) Content (%)	82,80	83,20	83.10	82,80	83.20	83,10	100.00	100.00	1
Meter Volume (dcf) (V <sub>m</sub> )	85.048	84.121	85,129	84.566	77.550	88.574	0,000	0,000	
Average square root of $\Delta P$ (( $V\Delta P$ ) <sub>avg</sub> )	0.503	0.521	0,509	0,500	0.483	0.529	#DIV/0I	#DIV/0!	
Absolute Stack Pressure ("Hg)	29,56	29,45	29,42	29,56	29.45	29,42	0.00	0.00	
Absolute Stack Temperature (°R)	1750.5	1818.8	1786.8	1734_9	1813.1	1782,2	#DIV/01	#DIV/0!	1781.0
Flue Gas Moisture (%)	8,19	8.71	11.13	10,54	12.28	11.09	#DIV/0!	#DIV/01	10.32
Moisture at saturation	N/A	N/A	N/A	N/A	N/A	N/A	#DIV/0!	#DIV/0!	ll X
Moisture used in Calculation	8.19	8.71	11.13	10.54	12.28	11,09	#DIV/01	#DIV/0!	10.32
Gas Molecular Weight (Wet) (g/g-mole)	28.42	28,30	28,03	28.15	27,90	28.04	#DIV/01	#DIV/0!	
Corrected Vol of Gas Sample (dcf) (V <sub>m(actual)</sub> )	82.582	81,681	82.660	82,959	76,077	86.891	0.000	0.000	
Volume at Meter (dscf)	78.035	78,998	77.444	78.265	73,693	81.468	#DIV/0!	#DIV/0!	
Average Gas Velocity (ft/sec)	51,48	54.64	53.17	51,18	50.87	55.16	#DIV/0!	#DIV/0!	52.75
Avg Flow Rate (acfh)	11,790,876	12,514,069	12,177,968	11,720,659	11,650,600	12,632,706	#DIV/0!	#DIV/01	12,081,147
Avg Flow Rate (acfm)	196,515	208,568	202,966	195,344	194,177	210,545	#DIV/0!	#DIV/0!	201,352
Avg Flow Rate (scfh)	3,513,860	3,576,078	3,538,668	3,524,309	3,339,735	3,680,332	#DIV/0!	#DIV/0!	3,528,830
Avg Flow Rate (scfm)	58,564	59,601	58,978	58,738	55,662	61,339	#DIV/0!	#DIV/0!	58,814
Avg Flow Rate (dscfh)	3,226,077	3,264,600	3,144,856	3,152,937	2,929,529	3,272,304	#DIV/0!	#DIV/0!	3,165,051
Avg Flow Rate (dscfm)	53,768	54,410	52,414	52,549	48,825	54,538	#DIV/0!	#DIV/01	52,751
Isokinetic Sampling Rate (%)	100.32	100.36	102.13	102.95	104.32	103.25	#DIV/0!	#DIV/0!	

Filter Weight Gain (mg)	34.9	80.4	35.7						
PNR Weight Gain (mg)	8,01	41.8	20.6						
Impinger Residue (mg)	82.4	67.4	47						0.00871
Front-Half Particulate Loading (gr/dscf)	0.00848	0.0239	0.0112	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	0.00971
Back-Half Particulate Loading (gr/dscf)	0.0163	0.0132	0.00936	NA	NA	NA NA	NA NA	NA NA	0.0165
Total Particulate Loading (gr/dscf)	0.0248	0.0370	0,0206	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	19.9
Front-Half Particulate Loading (mg/dscm)	19.4	54.6	25.7	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	29.6
Back-Half Particulate Loading (mg/dscm)	37.3	30.1	21.4	NA NA	NA	NA.	NA NA	NA NA	37.7
Total Particulate Loading (mg/dscm)	56.7	84.7	47.1	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	0.0132
Front-Half Particulate Loading O2 Corr (gr/dscf)	0.0128	0.0361	0.0171	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	0.0196
Back-Half Particulate Loading O <sub>2</sub> Corrected (gr/dscf)	0.0246	0.0199	0.0143	NA NA	NA	NA NA	NA	NA	0.0250
Total Particulate Loading O2 Corrected (gr/dscf)	0.0374	0.0560	0-0314	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	30.2
Front-Half Particulate Loading O <sub>2</sub> Corrected (mg/dscm)	29.3	82,5	39.2	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	44.9
Back-Half Particulate Loading O <sub>2</sub> Corrected (mg/dscm)	56.3	45.5	32.7	NA NA	NA	NA	NA	NA NA	57.1
Total Particulate Loading O <sub>2</sub> Corrected (mg/dscm)	85.7	128	71.9	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	4.02
Front-Half Particulate Emission (lbs/hr)	3.91	11.1	5.04	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	7,59
Total Particulate Emission (lbs/hr)	11.4	17,3	9,25	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE1	

### Data Entry Area

Sample Type	PM	Pitot Tube Correction Factor	0.83	Entered By (initials)	JC
Source	BVS 5	Console ID	URS-001	Checked by (initials)	SB
Condition	Non P	DGMCF	0,971	Corrected by (initials)	
Run	1	ΔH <sub>@</sub>	2,015		
Date	8-May	Nozzle Diameter (in)	0,3750	% CO	
Duct Diameter (ft)	9	Std Temp (°F)	68	% CO <sub>z</sub>	5.5
Duct Depth (ft)		Bar Press ("Hg, meas)	30.03	% O <sub>2</sub>	11.7
Duct Width (ft)		Meter Elev (ft) (rel to Brmtr)	450	% H <sub>2</sub>	
		Static Press ("H₂O)	-0.25	% CH₄	

Time	S	DGM Volt	ımes (as read)		Impinger Catch (g)		
start	13:25	start	971,208	_	Initial	Final	
stop	13:28	stop	973,178	1	369,3	464.9	95.6
start	15:10	start	973,884	2	607,4	616,7	9.3
stop	16:07	stop	1016.117	3	741.8	760_0	18.2
start	16:49	start	1016.269	4	829.4	853.7	24.3
stop	17:49	stop	1057-114	5			
start		start		6			
stop		stop		7			
start		start		8			
stop		stop		9			
start		start		10			
stop		stop					
start		start					
stop		stop					
start		start					
stop		stop					
start		start					
stop		stop					
						Total Wt Gain	147,4
Duration	120	Total	85,048				

Duration	120	lotal	83,048			
	ΔP ("H <sub>2</sub> O)	ΔΗ ("H <sub>2</sub> O)	Stack Temp (*F)	DGM Temp (*F)	VΔP	VΔH
Averages	0.26	1,58	1291	94.6	0,5026	1,2460
ndividual	0.18	1.00	1125	95	0.42426407	1
Readings	0,21	1.40	1267	84	0.45825757	1.18321
readings	0.21	1.40	1280	84	0.45825757	1.18321
	0.23	1.40	1281	85	0.47958315	1.18321
	0.25	1.50	1290	85	0.5	1 22474
	0.26	1.60	1292	85	0.50990195	1.2649
	0.29	1.80	1309	85	0.53851648	1.3416
	0.33	2.00	1334	86	0.57445626	1 4142
	0.35	2.10	1346	88	0.59160798	1.4491
	0.34	2,00	1347	89	0.58309519	1.4142
	0.36	2.10	1354	92	0,6	1.4491
	0.38	2,30	1345	95	0.6164414	1.5165
	0.20	1.20	1220	97	0.4472136	1.0954
	0.25	1.60	1247	97	0,5	1.2649
	0.28	1,80	1249	99	0.52915026	1,3416
	0.28	1.80	1262	99	0.52915026	1.3416
	0.28	1.80	1265	101	0,52915026	1,3416
	0.26	1.60	1279	102	0.50990195	1-2649
	0.28	1.70	1319	104	0.52915026	1.3038
	0,25	1.50	1318	104	0.5	1,22474
	0.23	1.40	1327	104	0.47958315	1,18321

1324

1298

1294

104

103

103

0.4472136 1.095445

0.41231056 1.048809

0.31622777 0.774597

0.20

0.17

0.10

1.20

1.10

0.60

### Data Entry Area

Sample Type	PM	Pitot Tube Correction Factor	0,83	Entered By (initials)	JC
Source	BVS 5	Console ID	URS-001	Checked by (initials)	SB
Condition	Prod	DGMCF	0.971	Corrected by (initials)	
Run	2	Δн∞	2.015	/	
Date	8-May	Nozzle Diameter (in)	0.3750	% CO	
Duct Diameter (ft)	9	Std Temp (°F)	68	% CO₂	5.1
Duct Depth (ft)		Bar Press ("Hg, meas)	29.92	% O <sub>2</sub>	11.7
Duct Width (ft)		Meter Elev (ft) (rel to Brmtr)	450	% H₂	
		Static Press ("H <sub>2</sub> O)	-0.25	% CH₄	

Time	s	DGM Volu	nes (es read)		Impinge	Catch (g)	
start	21:25	start	58,146		Initial	Final	
stop	22:25	stop	101.122	1	356,8	458,0	101.2
start	24:07	start	102.412	2	596,4	601,5	5.1
stop	01:07	stop	143,557	3	695.3	725.0	29.7
start		start		4	816.8	840.4	23.6
stop		stop		5			
start		start		6			
stop		stop		7			
start		start		8			
stop		stop		9			
start		start		10			
stop		stop					
start		start					
stop		atop					
start		start					
stop	1	stop					
start		start					
stop		stop					
					To	otal Wt Gain	159.6
Duration	120	Total	84.121				

h	 _	_	_	

Individual	0.23	1.40	
Readings	0.27	1.70	

- 1	ΔP ("H,O)	(OHC) HA	Stack Temp (*F)	DGM Temp (*F)	V∆P	VΔH
, [	0.27	1,60	1359	79.9	0.5213	1,262
al	0.23	1.40	1226	79	0.47958315	1.1832
,	0.27	1.70	1251	79	0.51961524	1,3038
	0.23	1.40	1238	78	0.47958315	1.1832
	0.26	1.60	1273	78	0.50990195	1.2649
	0.31	1.90	1291	79	0.55677644	1.3784
	0,33	2.00	1319	78	0,57445626	1.4142
	0.25	1.50	1275	78	0.5	1.2247
	0.32	2.00	1384	78	0.56568542	1.4142
	0.34	2,00	1368	78	0.58309519	1,4142
	0.31	1.80	1397	77	0.55677644	1,3416
	0.26	1.50	1410	79	0.50990195	1.2247
	0.17	0.97	1264	79	0.41231056	0.9848
	0.22	1.40	1348	78	0.46904158	1.1832
	0.23	1.30	1375	79	0.47958315	1,1401
	0.24	1.40	1386	80	0.48989795	1,1832
	0,25	1.40	1394	81	0.5	1.1832
	0.28	1.60	1401	82	0.52915026	1,2649
	0.28	1.60	1405	82	0.52915026	1.2649
	0.30	1,70	1412	83	0.54772256	1.3038
	0.29	1.60	1427	83	0.53851648	1-2649
	0.30	1.70	1437	82	0.54772256	1.3038
	0.32	1,80	1449	83	0.56568542	1,3416
	0.30	1.70	1449	82	0.54772256	1,3038
	0.27	1.50	1431	82	0.51961524	1-2247

Sample Type	PM	Pitot Tube Correction Factor	0,83	Entered By (initials)	JC	
Source	BVS 5	Console ID	URS-001	Checked by (initials)	SB	١
Condition	Non P	DGMCF	0,971	Corrected by (initials)		
Run	3	ΔH <sub>@</sub>	2,015			١
Date	9-May	Nozzle Diameter (in)	0,3750	% CO		
Duct Dlameter (ft)	9	Std Temp (°F)	68	% CO <sub>2</sub>	5,1	
Duct Depth (ft)		Bar Press ("Hg, meas)	29,89	% O <sub>2</sub>	11.8	
Duct Width (ft)		Meter Elev (ft) (rel to Brmtr)	450	% H <sub>2</sub>		
		Static Press ("H <sub>2</sub> O)	-0.25	% CH₄		

Tlme	S	DGM Volu	IMes (as read)		Imping	er Catch (g)	
start	14:38	start	145,213		Initial	Final	
stop	15:38	stop	189,442	1	369.4	509.9	140,5
start	17:01	start	189,563	2	607.7	620.4	12.7
stop	18:01	stop	230,463	3	756.1	786,2	30.1
start		start		4	796.5	818.5	22,09
stop		stop		5			
start		start		6			
stop		stop		7			
start		start		8			
stop		stop		9			
start		start		10			
stop		stop					
start		start					
stop		stop					
start		start					
stop		stop					
start		start					
stop		stop					
					1	otal Wt Gain	205.4
Duration	120	Total	85,129	Į.			

Aura	ra	~
MVE	ſd	ĸ

	ΔΡ ("Η <sub>2</sub> Ο)	ΔH ("H <sub>2</sub> O)	Stack Temp (*F)	DGM Temp (*F)	T v
ages	0.26	1,61	1327	96.8	0.5
/idual	0.27	1.60	1298	97	0.519

Individual Readings

ΔP ("H <sub>2</sub> O)	ΔΗ ("Η <sub>2</sub> 0)	Stack Temp (*F)	DGM Temp (*F)	VΔP	V∆H
0,26	1,61	1327	96.8	0,5091	1.2610
0.27	1.60	1298	97	0.51961524	1.264911
0.20	1.30	1280	97	0.4472136	1.140175
0.22	1.40	1289	97	0.46904158	1.183216
0.22	1.40	1302	97	0.46904158	1,183216
0.25	1.60	1305	97	0.5	1.264911
0.25	1.60	1311	97	0.5	1.264911
0.28	1.70	1339	97	0.52915026	1.30384
0.30	1.90	1339	98	0.54772256	1.378409
0.34	2.10	1384	98	0.58309519	1,44913
0.36	2.20	1385	97	0.6	1.48324
0.37	2.20	1388	97	0.60827625	1.48324
0.37	2.20	1387	97	0.60827625	1.48324
0.23	1.40	1261	96	0.47958315	1.183216
0.26	1.70	1280	95	0.50990195	1.30384
0.26	1.60	1302	96	0.50990195	1.26491
0.25	1.60	1285	96	0.50330135	1.26491
0.27	1.70	1303	96	0.51961524	1.30384
0.28	1.70	1350	97	0.52915026	1.30384
0.28	1.70	1347	97	0.52915026	1.30384
0.25	1.50	1359	97	0.52913020	1.224745
0.23	1.40	1354	96	0.48989795	1.183216
0.20	1.10	1334	97	0.48989795	
0.19	1.10	1349	96		1.048809
				0.43588989	1.048809
0.15	0.90	1296	97	0.38729833	0.948683

### Data Entry Area

		Data silely rica			
Sample Type Metals		Pitot Tube Correction Factor	0,83	Entered By (initials)	JC
Source	BVS 5	Console ID	URS-005	Checked by (initials)	SB
Condition	Non P	DGMCF	0.981	Corrected by (initials)	
Run	1	ΔH <sub>®</sub>	1,947		
Date	8-May	Nozzle Diameter (in)	0.3750	% CO	
Duct Diameter (ft)	9	Std Temp (°F)	68	% CO <sub>2</sub>	5.5
Duct Depth (ft)		Bar Press ("Hg, meas)	30.03	% O₂	11.7
Duct Width (ft)		Meter Elev (ft) (rel to Brmtr)	450	% H₂	
		Static Press ("H <sub>2</sub> O)	-0,25	% CH₄	

Time	es .	DGM Vol	umes (as read)		Impin	ger Catch (g)	
start	13:25	start	550.215		Initial	Final	
stop	13:29	stop	552,518	1	712.1	875,2	163,1
start	15:11	start	554,070	2	692.2	707.0	14.8
stop	16:07	stop	591,745	3	627,7	629,3	1.6
start	16:49	start	592,000	4	712.7	711,2	-1,5
stop	17:49	stop	636.588	5	717,7	719.6	1,9
start		start		6	853.6	868,9	15,3
stop		stop		7			
start		start		8			
stop		stop		9			
start		start		10			
stop		stop					
start		start					
stop		stop					
start		start					
stop		stop					
start		start					
stop		stop					
						Total Wt Gain	195.2
Duration	120	Total	84.566				

Δ١	(e)	a	ae
М١	/ei	d	ĸ٠

Individual Readings

	0.25	1.41	1275	95,3	0.4995	1.1770
_						
	0.27	1.40	1275	83	0,51961524	1,183216
	0.30	1.70	1276	83	0.54772256	1,3038405
	0.29	1.60	1276	83	0,53851648	1.2649111
	0.29	1.60	1285	84	0.53851648	1,2649111
	0.31	1.70	1283	84	0.55677644	1.3038405
	0.30	1.70	1287	84	0.54772256	1,3038405
	0.27	1.50	1308	85	0.51961524	1.2247449
	0.23	1.30	1,358	85	0.47958315	1,1401754
	0.17	0.93	1349	86	0.41231056	0,9643651
	0.16	0.88	1330	87	0,4	0.9380832
	0.13	0.70	1275	90	0.36055513	0.83666
	0.10	0.54	1275	92	0.31622777	0.7348469
	0.22	1.20	1177	99	0.46904158	1.0954451
	0.23	1.30	1180	100	0.47958315	1.1401754
	0.24	1.30	1197	101	0.48989795	1.1401754
	0.25	1.40	1210	102	0.5	1,183216
	0.25	1.40	1236	103	0.5	1.183216
	0.25	1.40	1242	105	0.5	1.183216
	0.30	1.70	1273	107	0.54772256	1,3038405
	0.29	1.60	1282	108	0.53851648	1,2649111
	0.30	1.70	1297	108	0.54772256	1.3038405
	0.30	1.70	1310	109	0.54772256	1,3038405
	0.32	1.80	1300	109	0.56568542	1,3416408
	0.32	1.80	1317	109	0.56568542	1.3416408

ΔΡ [ H<sub>1</sub>O<sub>1</sub> ΔΗ [ H<sub>2</sub>O<sub>2</sub> Stack Temp (\*F) DGM Temp (\*F) VΔΡ VΔΗ

### Data Entry Area

		Data Entry Area				
Sample Type	Metals	Pitot Tube Correction Factor	0.83	Entered By (initials)	JC	1
Source	BVS 5	Console ID	URS-005	Checked by (initials)	SB	Ì
Condition	Prod	DGMCF	0.981	Corrected by (initials)		1
Run	2	ΔH <sub>g</sub>	1.947	2.0		
Date	8-May	Nozzle Diameter (in)	0.3750	% CO		
Duct Diameter (ft)	9	Std Temp (°F)	68	% CO₂	5.1	
Duct Depth (ft)		Bar Press ("Hg, meas)	29.92	% O <sub>2</sub>	11.7	
Duct Width (ft)		Meter Elev (ft) (rel to Brmtr)	450	% H₂		
		Static Press ("H <sub>2</sub> O)	-0.25	% CH₄		

	Catch (g)	Impinger		mes (as read)	DGM Volu	s	Time
	Final	Initial		638,145	start	21:25	start
189.3	897,2	707,9	1	674.889	stop	22:25	stop
12.8	712,9	700.1	2	675,148	start	00:07	start
1.5	604.5	603.0	3	715,954	stop	01:07	stop
-0.9	713.7	714.6	4		start		start
0,	714.6	714.5	5		stop		stop
15	856.5	840,8	6		start		start
			7		stop		stop
			8		start		start
			9		stop		stop
			10		start		start
					stop		stop
					start		start
					stop		stop
					start		start
					stop		stop
					start		start
					stop		stop
218,5	tal Wt Gain	То					
				77.550	Total	120	Duration

	ΔP ("H <sub>1</sub> O)	ΔH ("H <sub>2</sub> O)	Stack Temp (*F)	DGM Temp (*F)	V∆P	V∆H
Averages	0.24	1.37	1353	78.7	0.4826	1.1541
Individual	0.10	0.56	1107	78	0.31622777	0.74833
Readings	0.11	0,88	1107	78	0.33166248	0.93808
	0.22	1.40	1162	78	0.46904158	1,18322
	0.25	1.60	1202	78	0.5	1.26491
	0.20	1.20	1250	78	0.4472136	1,09545
	0.22	1.40	1318	78	0.46904158	1,18322
	0.26	1,60	1262	78	0,50990195	1.26491
	0.19	1.10	1297	78	0.43588989	1,04881
	0.21	1.10	1354	78	0,45825757	1.04881
	0.10	0.58	1368	77	0.31622777	0,76158
	0.10	0.58	1390	79	0.31622777	0.76158
	0.30	1.70	1472	80	0,54772256	1.30384
	0.28	1.60	1369	76	0.52915026	1,26491
	0.27	1.50	1381	76	0,51961524	1.22474
	0.22	1,20	1380	77	0.46904158	1,09545
	0.23	1.30	1384	78	0.47958315	1,14018
	0.23	1.30	1400	78	0,47958315	1.14018
	0.30	1.60	1409	79	0,54772256	1,26491
	0.34	1.80	1517	80	0.58309519	1,34164
	0.34	1.80	1514	81	0,58309519	1.34164
	0.34	1.80	1513	81	0,58309519	1.34164
	0.36	1.90	1506	81	0.6	1,3784
	0.35	1,90	1502	82	0.59160798	1.3784
	0.25	1.40	1310	82	0.5	1.18322

### Data Entry Area

Sample Type	Metals	Pitot Tube Correction Factor	0.83	Entered By (initials)	JC	1
Source	BVS 5	Console ID	URS-005	Checked by (initials)	SB	1
Condition	Non P	DGMCF	0,981	Corrected by (initials)	JC	1
Run	3	ΔH <sub>@</sub>	1,947	19400 0-000		•
Date	9-May	Nozzle Diameter (in)	0.3750	% CO		
Duct Diameter (ft)	9	Std Temp (°F)	68	% CO₂	5,1	
Duct Depth (ft)		Bar Press ("Hg, meas)	29.89	% O <sub>2</sub>	11.8	
Duct Width (ft)		Meter Elev (ft) (rel to Brmtr)	450	% H <sub>2</sub>		
		Static Press ("H <sub>2</sub> O)	-0,25	% CH₄		

Time	S	DGM Vol	umes (as read)		Imping	er Catch (g)	
start	14:38	start	724,490		Initial	Final	
stop	15:38	stop	768,269	1	711,3	892,5	181.2
start	17:01	start	768,455	2	703,9	718.7	14.8
stop	18:01	stop	813,250	3	606.9	608.3	1.4
start		start		4	712,9	719,2	6.3
stop		stop		5	717,9	713,5	-4.4
start		start		6	822.2	838.0	15.8
stop		stop		7			
start		start		8			
stop		stop		9			
start		start		10			
stop		stop					
start		start					
stop		stop					
start		start					
stop		stop					
start		start					
stop		stop					
						Total Wt Gain	215,1
Duration	120	Total	88.574	,			

Αv	er	а	ge

Individual Readings

AP ("H,O)	AH ("HO)	Stack Temp (*F)	DGM Temp (*F)	VΔP	V∆H
0.28	1,51	1322	96.2	0,5289	1.2264
0.26	1.40	1315	95	0.50990195	1 1832
0.28	1.50	1316	95	0,52915026	1.2247
0.30	1.60	1308	96	0.54772256	1 2649
0.29	1.60	1324	96	0.53851648	1.2649
0.30	1.60	1331	96	0.54772256	1,2649
0.31	1.70	1350	96	0.55677644	1,3038
0.29	1,60	1394	96	0.53851648	1.2649
0.31	1.70	1383	96	0.55677644	1,3038
0.25	1.40	1384	97	0.5	1.1832
0.25	1.30	1385	96	0,5	1,1401
0.23	1.30	1370	96	0.47958315	1.1401
0.20	1.10	1355	96	0,4472136	1.0488
0.23	1.20	1230	94	0,47958315	1,0954
0.23	1.20	1242	95	0.47958315	1,0954
0.25	1.30	1258	96	0.5	1.1401
0.25	1.30	1250	96	0.5	1.1401
0.25	1.40	1262	96	0.5	1.1832
0.28	1.50	1287	96	0.52915026	1,2247
0.30	1.60	1300	97	0.54772256	1.2649
0.30	1.60	1304	97	0.54772256	1.2649
0.32	1.70	1338	97	0.56568542	1,3038
0.35	1.80	1344	98	0.59160798	1,3416
0.35	1.90	1344	98	0.59160798	1.3784
0.37	2.00	1358	98	0.60827625	1,4142

### **Condensable PM Results**

Parameter	Run 1	Run 2	Run 3	Field blank	Proof blank
Inorganic (mg)	84.0	69.3	49.2	2.80	3.46
Organic (mg)	2.48	2.18	1.89	1.29	1.56
Filter (mg)	NR	NR	NR	NR	NR
Total (mg)	86.5	71.5	51.1	4.1	5.0
Blank correction (mg) *	4.1	4.1	4.1		
Net condensable PM	82.4	67.4	47.0		

<sup>\*</sup> Allowed by Memorandum to: EPA Regional Air Division Directors, Regions 1-10; from: Stephen Page, Director OAQPS; subject: Interim Guidance on the Treatment of Condensable Particulate Matter Test Results in the Prevention of Significant Deterioration and Nonattainment New Source Review Permitting Programs; April 8, 2014

### Filterable PM Results

Parameter	Run 1	Run 2	Run 3
Filter (mg)	34.9	80.4	35.7
Probe/nozzle rinse (mg)	8.01	41.8	20.6
Total filterable PM (mg)	42.9	122.2	56.3

### **Metals Results**

Parameter	Run 1	Run 2	Run 3
Sample volume (dscf)	78.26	73.69	81.47
Sample volume (dscm)	2.216	2.087	2.307
Lead in filter/PNR (ug)	629.0	1070	847
Lead in Imp 1&2 (ug)	6.00	4.69	2.64
Lead in sample (ug)	635.0	1074.7	849.6
Lead Conc. (ug/ft3)	8.113	14.583	10.429
Lead Conc. (ug/m3)	286.5	515.0	368.3
Mercury in filter/PNR (ug)	0.188	0.321	ND
Mercury in Imp 1&2 (ug)	13.7	18.5	19.0
Mercury in Imp 3 (ug)	2.4	1.4	2.34
Mercury in Imp 4&5 (ug)	0.559	0.240	0.546
Mercury in HCl rinse (ug)	7.89	5.95	6.36
Mercury in sample (ug)	24.7	26.4	28.2
Mercury Conc. (ug/ft3)	0.3161	0.3584	0.3467
Mercury Conc. (ug/m3)	11.16	12.66	12.24

Plant Name Sampling Location Date CEM Operator Project Number

Gateway Energy & Coke
Bypass Stack 5
May 5-6, 2017
Chandra Sastry
60542107

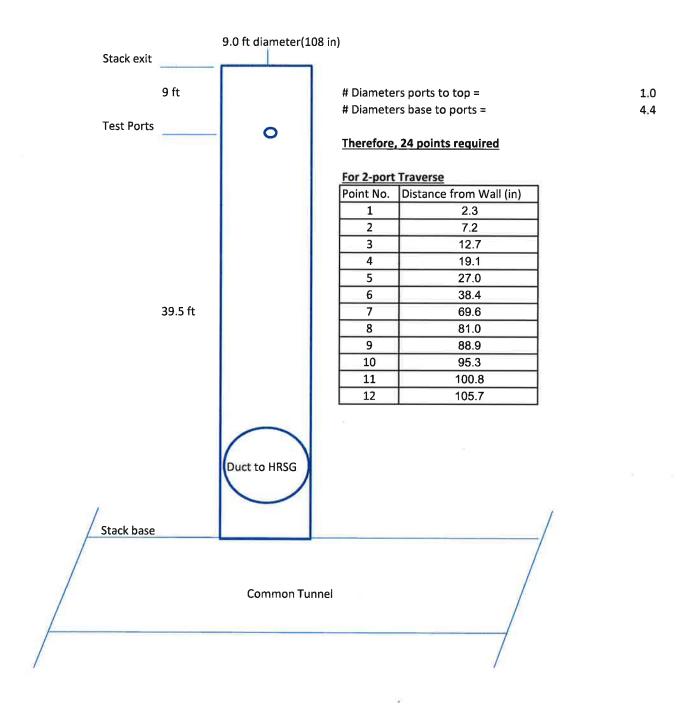
### **Observed Values**

Run No.	Date	Start	Stop	Start - Stop	Reference	Reference Method Obs. Value	Value
		Time	Time	Time	02	CO <sub>2</sub>	XON
1	5/5/2017	1520	1641	1520 - 1641	9.6	6.9	33.91
2	5/5/2017	1930	2115	1930 - 2115	7.6	8.1	48.27
3	5/6/2017	1320	1500	1320 - 1500	11.7	5.4	23.51

### **Bias-Adjusted Values**

Run No.	Date	Start	Stop	Start - Stop	Reference	Reference Method Adj. Value	Value
		Time	Time	Time	05	co <sub>2</sub>	XON
1	5/5/2017	1520	1641	1520 - 1641	9.7	7.0	34.61
2	5/5/2017	1930	2115	1930 - 2115	7.7	8.5	49.34
က	5/6/2017	1320	1500	1320 - 1500	11.7	5.5	24.04

### **Bypass Vent Stack Traverse Points**



Sample Type	HCI/CI 2	EPA Method 2	26A D	ate 5/	5/17	Noz (in)	zzle Dia	0,37	15	Page		of /
Project Name	GCO Stack	Tests	Co	ond	Run /	Bar-	ometer	heathe		Tr	rain Leak Rat	e (cfm @ "Hg)
Project Number	60542107		Co	onsole ID/	35-00		. Press.	199	Α	-	0.0	@ 4"
Facility	SunCoke E	nergy GCO	ΔΙ	н@ 2.	0)5	Stat	t. Press.	-17.2	)	Final	0,0	@ = 111
Source	ByPass Vei		Kr			("H <sub>2</sub>	be ID	704	522	Pitot		neck ("H <sub>2</sub> O@"H <sub>2</sub> O)
Operator	We	T/40/5	\$ D	GMCF ()	971	Pito	ot ID	707		Initial (-)	1 1/1	@ 4"
Duct Dime		1010	Fil	lter No.	1/1	PTC	CF /	2.83		Initial (+		@ 47
Nozzle Cal	ibration					Met			7	Final (-)		e 5°
Caliper ID			375	0.37	$\leq 20.3$	5 1/5 (rela	vation (ft) ativeto ometer)	546	450	Final (+)	1	e 5"
	16150	DGM Reading					Tem	perature (°F	)			
Point '	Clock Time	(ft³)	<b>ΔP</b> ("H₂O)	<b>ΔH</b> ("H₂O)	Stack	Probe Target 248-		Filter rget 248-273	Imp Ex Target <6	it i8 C	GM Outlet	Vacuum ("Hg)
BIZ	0	811.706	228	1,7	1469	N/F	1 /	148	58	3	93	7/2
11	3	913.9	0.28	1,6	1468		2	260	56	7	94	21/2
10	6	316,1	0,28	1,6	1463		1	255	55	7	94	2/2
9	9	818,2	0.26	1.5	1464		0	249	57	7	96	2/2
8	12	820.3	0,29	1.6	1458		6	158	58	3	97	3
7	15	822,4	0.27	1,6	1450		ó	150	59		97	3,
- Ø	18	824.5	2,25	1,4	1420			251	61		48	2/2
5	7	826.6	0,28	1,0	1401		0	254	60		94	3
4	24	3200	0.28	1,0	1410		0	257	6-2	>	99	3
3 2	27 30	030,9	0,29	1,4	1395		Ó	200	25	`	100	21/2
2		0010	0561	1,2	1201		-9	110	5/	. /	100	2
Cton	33	331.407	0,15	(). 1	1014		0	248	22		100	<u></u>
AIR	36	036,497	0.23	1,4	1297			164	(0)		93	21/2
1112	39	838.5	0.74	14	14-23		7	754	69	+	91	71/2
10	42	8405	0.22	1,3	142A		5	763	5	7	94	2/2
9	45	8424	0.23	1.3	1413		7	359	54		94	21/2
8	48	844.3	0.23	1:3	1415		6	260	56	7	94	2/2
7	5)	846.2	0.28	1.6	1412		12	260	57	7	95	3
6	54	848.3	0,28	16	1385		6	255	58	3	95	3
54	57	850,4	0.26	1,5	1362		2	160	59		97	3
4	60	852.6	0.25	1.5	1366		2	156	61		47	3,
3	63	854.7	0.23	1,4	1361		6	249	62		97	21/2
2	66	856.7	0.16		1318		2	255	63		17	2
	69	858.5	0.17	1.0	1094	Te	2	58	23		47	2
STOP	71	860.195			1318	Fall						
*	18/122				(su st.							(9/
	10						-					
	17:05											
Notes:						_						
10142									- <i>SD</i> .	5-21:	HCl, Cl2 by El	PA Method 26A er EM SOP-021
									-		Issued:	er EM SOP-021 : January 2017

Sample

2 66 905,5 0,25 1,3 1549 259 54 92 2/2 1 69 907,3 0.18 0.98 1540 259 55 92 2/2 Star 72 909.057 27;11 909.057	Sample Type	HCI/CI	EPA Method	26A Da	ite 5/	15/17		Nozzle D (in)	ia 0.37	15	Page	1	of /
Polyte   Surface   Console   O	Project Name	GCO Stack	Tests	Co	ond	Run 2			011		Т	rain Leak Rat	e (cfm @ "Hg)
Section   Surcoke Energy GCO   Display   Superior   Stack   Process   Stack   Process   Stack   Superior   Stack   Stack   Stack   Superior   Stack   Stack   Superior   Stack	Project	60542107		Co	nsole ID	RS-00	27	Bar. Pres	s. 70 a		Initial	0005	e /1)
Source ByPass Vent Stack #5, No.	D	SunCoke E	nergy GCO	ΔΗ	10 2	015		Stat. Pres		1	Final		e 5"
Control   Cont	Source	ByPass Vei	nt Stack #5	Kf	,		-		1704	522	Pitot		====================================
Duct Dimension(s) 9   Site No.   PTC   0.83   Initial (s)   Signal (s)	Operator	WOI	20.1	P DG	EMCF O.	971		Pitot ID					
Cock Time   DGM Reading   PCHO    AH (PHO)   Stack   Properature (PT)   Imperite (PT)   Impe	Duct Dime	nsion(s)	9.	Fil	ter No.			PTCF	0.83	3	Initial (	030	1 11
California   Dom Reading   Ap (Ph.0)   Ah (Ph.0)   Ah (Ph.0)   Stack   Progressive (Ph.0)   Imperiator (	Nozzle Cali	bration							(ft) / N	650	Final (-)		e 4"
Notes:   Note	Caliper ID_			/		_ ~ _		(relativeto	W.	400	Final (+	-) /	e 4"
Notes:   Note	Point	1930 Clock Time		ΔP ("H <sub>2</sub> O)	<b>AH</b> ("H <sub>2</sub> O)		T 5.				I		Vaćuum ("Ha)
1	1			0 15	2.1 (20)		Target	248-273		Target <	68		Vacuum ( mg)
1	4/2	0	0100	0.17	1,0	10/1	N	A	256		)-	l. /	4
9 9 965.8 0.20 1.2 1422 261 57 98 2 8 12 867.6 0.24 1.4 1455 288 58 98 2/9 7 15 869.1, 0.27 1.6 1478 269 50 99 3 6 18 871.7 0.31 1.8 1505 256 61 100 3/2 5 21 874.0 0.21 1.6 1509 256 62 100 3 4 24 876.2 0.26 1.5 151 256 63 100 3 3 27 878.2 0.35 1.4 1546 257 64 101 3 2 30 880.2 0.18 1.0 1449 255 64 101 3 3 3 862.2 0.13 0.75 1400 256 64 101 3 8 2 36 883.44 266 257 64 101 3 9 45 883.44 266 257 64 101 3 9 45 884.02 0.30 1.6 1595 272 57 99 3/2 1/ 39 286.3 0.30 1.6 1595 272 57 99 3/2 1/ 39 286.3 0.30 1.6 1621 260 51 97 3/2 1/ 39 286.3 0.30 1.6 1621 260 51 97 3/2 1/ 2 42 888.5 0.28 1.5 1619 260 51 97 3/2 2 5 8 8 90.7 0.27 1.4 1611 254 51 96 21/2 8 48 893.7 0.31 1.6 1609 255 51 95 3 6 54 897.1 0.21 1.4 1611 254 51 96 21/2 8 48 893.7 0.31 1.6 1609 255 51 95 3 6 54 897.1 0.21 1.5 1551 258 54 94 21/2 3 63 90.3 0.27 1.5 1551 258 54 94 21/2 3 63 90.3 40.26 1.4 1550 258 54 94 21/2 3 63 90.3 40.26 1.4 1550 258 54 94 21/2 3 63 90.3 40.26 1.4 1550 258 54 94 21/2 3 63 90.3 40.26 1.4 1550 258 54 94 21/2 3 63 90.3 40.26 1.4 1550 258 54 92 21/2 3 63 90.3 40.26 1.4 1550 258 54 94 21/2 3 63 90.3 40.26 1.4 1550 258 54 94 21/2 3 63 90.3 40.26 1.4 1550 258 54 92 21/2 3 63 90.3 40.26 1.4 1550 258 54 92 21/2 3 63 90.3 40.26 1.4 1550 258 54 92 21/2	//	7	100		1,1	1001			250		/		' /
8 12 867.6 0.24 1.4 1455 238 58 98 21/2 7 15 869.6 0.24 1.4 1455 258 58 98 21/2 6 18 871.7 0.31 1.6 1478 259 50 99 3 6 18 871.7 0.31 1.6 1505 256 61 100 31/2 5 21 874.0 0.29 1.6 1509 256 62 100 3 4 24 876.2 0.24 1.5 1519 258 63 100 3 3 27 878.2 0.35 1.4 1546 257 64 101 3 2 30 880.2 0.18 1.0 1449 255 64 101 3 3 382.2 0.13 0.75 1400 256 64 101 3 820 36 883.44 256 64 101 3 81/2 36 883.44 260 51 97 31/2 1/ 39 386.3 0.30 1.6 1595 272 57 99 31/2 1/ 39 386.3 0.30 1.6 1621 260 51 97 31/2 1/ 39 386.3 0.30 1.6 1621 260 51 97 31/2 1/ 39 386.3 0.30 1.6 1621 260 51 97 31/2 1/ 39 386.3 0.30 1.6 1621 260 51 97 31/2 1/ 39 386.3 0.30 1.6 1621 260 51 97 31/2 1/ 39 386.3 0.30 1.6 1621 260 51 97 31/2 2 588.5 0.28 1.5 1619 260 51 97 31/2 3 63 890.7 0.21 1.4 1611 254 51 96 21/2 3 64 897.1 0.27 1.4 1611 254 51 96 21/2 3 65 890.7 0.31 1.6 1609 258 52 95 3 5 57 899.2 0.28 1.5 1550 258 54 94 21/2 2 66 905.5 0.25 1.3 1549 259 54 92 21/2 3 63 903.4 0.26 1.4 1530 258 54 92 21/2 2 66 905.5 0.25 1.3 1549 259 54 92 21/2 2 66 905.5 0.25 1.3 1549 259 54 92 21/2 3 63 909.057 30/8 0.98 1540 859 55 92 21/2			064.0	0, 7	1.7	1403			25/	50	7	1/	2
7 15 869, 6 0.27 1,6 1478 259 50 99 3,6 18 901,7 0,31 1,8 1505 256 61 100 3/2 5 21 874,0 0.29 1,6 1509 256 62 100 3 4 24 876,2 0.26 1,5 1519 258 63 100 3 27 878,2 0,35 1,4 1546 257 64 101 3 2 30 880,2 0.18 1,0 1449 255 64 101 3 2 30 880,2 0.18 1,0 1449 255 64 101 3 2 30 883,44 255 64 101 3 2 36 883,44 25 2 36 883,44 25 2 36 883,44 25 2 36 883,44 25 2 36 883,44 25 2 36 883,44 25 2 36 883,44 25	6	17	2676	0.20	1,2	1466			2/0	56	2	70	de M
6 18 671.7 0.31 1.8 1605 256 61 100 3/2.  5 21 874.0 0.20 1.6 1509 256 62 100 3 4 24 876.2 0.26 1.5 1519 258 63 100 3 3 27 878.2 0.35 1.4 1546 257 64 101 3 2 30 880.2 0.18 1.0 1444 255 64 101 3 1 33 862.2 0.13 0.75 1400 256 64 101 3 8 28 883.24 26 26 26 26 26 26 26 26 26 26 26 26 26	3	15		0.201	16	1470	_		-	20	,	98	2/2
\$\frac{21}{4} \frac{874}{6} \frac{0}{2} \frac{1}{1} \frac{6}{6} \frac{1909}{9} \frac{25}{256} \frac{62}{62} \frac{100}{3} \frac{3}{4} \frac{24}{24} \frac{876}{6} \frac{2}{2} \frac{0.26}{1.5} \frac{1.5}{1.5} \frac{1.5}{1.9} \frac{25}{256} \frac{64}{101} \frac{3}{3} \frac{37}{64} \frac{101}{101} \frac{3}{3} \frac{360}{3} \frac{2}{2} \frac{0.13}{101} \frac{1.444}{101} \frac{255}{256} \frac{64}{101} \frac{3}{3} \frac{102}{362} \frac{363}{363} \frac{363}{144} \frac{256}{256} \frac{64}{101} \frac{101}{3} \frac{256}{363} \frac{64}{101} \frac{101}{2} \frac{2}{2} \frac{57}{363} \frac{64}{363} \frac{101}{3} \frac{3}{2} \frac{64}{363} \frac{101}{3} \frac{3}{2} \frac{64}{363} \frac{101}{3} \frac{3}{2} \frac{100}{363} \frac{102}{3} \frac{3}{3} \frac{107}{3} \fr	6	18	871.7	0.01	1.0	1605			256	61		100	31/2
4 24 676,20.26 1.5 1519 258 63 170 3 3 27 878,2 0,35 1,4 1546 257 64 101 3 2 30 880.2 0,18 1.0 1449 255 64 101 3 1 33 862,2 0,13 0,75 1400 256 64 101 3 5xx 36 883,44 8x 36 883,846 8x2 36 884.002 0,30 1,6 1595 272 57 99 3/2 11 39 286,3 0,30 1,6 1621 260 51 97 3/2 10 42 888,5 0,28 1,5 1619 260 51 97 3/2 10 42 888,5 0,28 1,5 1619 260 51 97 3,9 45 892,7 0,27 1,4 1611 254 51 96 21/2 2 88 893,7 0,31 1,6 1609 258 51 95 3 7 51 894,9 0,31 1,6 1609 258 52 95 3 5 57 897,2 0,28 1,5 1550 258 54 94 2/2 4 60 901,3 0,27 1,5 1555 258 54 94 2/2 2 66 905,5 0,25 1,3 1549 258 54 94 2/2 2 66 905,5 0,25 1,3 1549 258 54 92 2/2 1 69 907,3 0,18 0,98 1540 259 55 92 2/2 5 57 309.057	5		87410	0.79	1,6	1509			256	(00	2	100	-2
3 27 878,2 0,35 1,4 1546 257 64 101 3 2 30 880.2 0,18 1.0 1449 255 64 101 3 1 33 862.2 0,13 0,75 1400 256 64 101 3 Step. 36 883,744 BIZ 36 884,002 0,30 1,6 1595 272 57 99 3/2 11 39 286,3 0,30 1,6 1621 260 51 97 3/2 10 42 888,5 0,28 1,5 1619 260 51 97 3/2 10 42 888,5 0,28 1,6 1611 264 51 96 21/2 3 48 892,7 0,27 1,4 1611 264 51 96 21/2 3 48 893,7 0,31 1,6 1609 255 51 95 3 7 51 844 9 0,31 1,6 1609 255 52 95 3 5 57 899,2 0,28 1,5 1550 258 54 94 21/2 4 60 901,3 0,27 1,5 1555 258 54 94 21/2 2 66 905,5 0,25 1,3 1549 258 54 94 21/2 2 66 905,5 0,25 1,3 1549 258 54 92 21/2 1 69 907,3 0,18 0,98 1540 259 55 92 2/2 1 69 907,3 0,18 0,98 1540 259 55 92 2/2 1 69 907,3 0,18 0,98 1540 259 55 92 2/2	4		876,2	0.26	1/	1519			258	6	3	100	3
1 33 862, 2 0, 3 0, 75 1400 250 64 102 2  Sec. 36 883, 344  B/2 36 883, 816  B/2 36 884, 002 0, 30 1, 8 1595 272 57 99 3/2  1/ 39 886, 3 0, 30 1, 6 1621 260 51 97 3/2  10 42 888, 5 0, 28 1, 5 /619 260 5) 97 3  9 45 890, 7 0, 27 1, 4 /611 254 51 96 21/2  8 48 893, 7 0, 31 1, 6 1609 255 51 95 3  5 51 894, 9 0, 31 1, 6 1600 258 52 95 3  6 54 897, 1 0, 29 1, 5 1555 258 54 94 21/2  4 60 901, 3 0, 27 1, 5 1551 258 54 94 21/2  3 63 903, 40, 26 1, 4 1550 258 54 94 21/2  2 66 905, 5 0, 25 1, 3 1549 259 54 92 21/2  1 69 907, 3 0, 18 0, 98 1540 859 55 92 21/2			2000	0,25	1,4	1546			257	64	7	101	3
Sec. 36 883,744  Style 36 883,846  B/Z 36 884.002 0.30 1.6 1595  1/ 39 886,3 0.30 1.6 1621  260 51 97 3/2  10 42 888,5 0.28 1.5 /619 260 51 97 3/2  9 45 890,7 0.21 1.4 /611 254 51 96 21/2  8 48 893,7 0.31 1.6 1609 255 51 95 3  7 51 894.9 0.31 1.6 1600 258 52 95 3  6 54 897.1 0.29 1.5 1555 255 53 95 21/2  5 57 899.2 0.28 1.5 1550 258 54 94 21/2  4 60 901.3 0.21 1.5 1551 258 54 94 21/2  2 66 905,5 0.25 1.3 1549 259 54 92 21/2  1 69 907,3 0.18 0.98 1540 859 55 92 2/2  Star 72 909.057			880.2	0 10	1.0	1449			255	64		101	3
B/Z 36 884.00Z 0.30 1,6 1695 272 57 99 3/2 1/2 39 886.3 0.30 1,6 1621 260 51 97 3/2 10 42 888.5 0.28 1.5 1619 260 51 97 3/2 9 45 890.7 0.27 1,4 1611 254 51 96 21/2 88 890.7 0.31 1.6 1609 258 51 95 2 7 51 394.9 0.31 1.6 1600 258 52 95 3 6 54 397.1 0.29 1.5 1555 255 53 95 2/2 5 57 899.2 0.28 1.5 1550 258 54 94 21/2 4 60 901.3 0.27 1.5 1551 258 54 94 21/2 3 63 903.40.26 1.4 1550 258 54 94 21/2 2 66 905.5 0.25 1.3 1549 259 54 90 21/2 1 64 907.3 0.18 0.98 1540 259 55 92 21/2 1 64 907.3 0.18 0.98 1540 259 50 50 50 50 50 50 50 50 50 50 50 50 50	1	33	382,2	0.13	0,75	1400			256	602	-	102	
B/Z 3G 884.002 0.30 1, B 1595 272 57 99 3/2  1/ 39 886.3 0.30 1, B 1621 260 51 97 3/2  10 42 888.5 0.28 1, G 1619 360 5) 977 3, 9 45 890.7 0.27 1, 4 1611 254 51 96 21/2  8 48 893.7 0.31 1.6 1609 258 51 95 3  7 51 894.9 0.31 1.6 1600 258 52 95 3  6 54 897.1 0.29 1.5 1555 255 53 95 21/2  5 57 899.2 0.28 1.5 1550 258 54 94 21/2  4 60 901.3 0.27 1.5 1351 258 54 94 21/2  2 66 905.5 0.25 1, 3 1549 259 54 92 21/2  1 69 907.3 0.18 0.98 1540 259 55 92 21/2  SDS-21: HCl, Cle by EPA Method 260		136	283,744										
1   39   286,3   0,30   1,6   162     260   51   97   31/2   10   42   888,5   0,28   1,5   161   9   360   51   97   3,5   9   45   890,7   0,27   1,4   1611   254   51   96   21/2   8   48   893,7   0,31   1,6   1600   258   51   95   3   7   51   894,9   0,31   1,6   1600   258   52   95   3   5   5   3   95   21/2   5   57   899,2   0,28   1,5   1550   258   54   94   21/2   4   60   901,3   0,27   1,5   1,55   258   54   94   21/2   3   63   903,40,26   3,4   1550   258   54   94   21/2   2   66   905,5   0,25   1,3   1549   259   54   92   21/2   1   69   907,3   0.18   0.98   1540   259   55   92   21/2   1   69   907,3   0.18   0.98   1540   259   55   92   21/2   1   69   907,3   0.18   0.98   1540   259   55   92   21/2   1   69   907,3   0.18   0.98   1540   259   55   92   21/2   1   69   907,3   0.18   0.98   1540   259   55   92   21/2   1   69   907,3   0.18   0.98   1540   259   55   92   21/2   1   69   907,3   0.18   0.98   1540   259   55   92   21/2   1   69   907,3   0.18   0.98   1540   259   55   92   21/2   1   69   907,3   0.18   0.98   1540   259   55   92   21/2   1   69   907,3   0.18   0.98   1540   259   55   92   21/2   1   69   907,3   0.18   0.98   1540   259   1540   259   1540   259   1540   259   1540   259   250	15/2	-310	00100	000	4 (2	2/0/			010			aa	
10 42 888,50,28 1,5 1619 360 5) 977 3,9 45 892,7 0,27 1,4 1611 254 51 96 21/2 8 48 892,7 0,31 1.6 1609 258 52 95 3 51 95 3 51 894.9 0,31 1.6 1600 258 52 95 3 6 54 897.1 0,29 1,5 1555 255 53 95 21/2 5 57 899.2 0,28 1,5 1550 258 54 94 21/2 4 60 901.3 0,27 1,5 1551 258 54 94 21/2 2 66 905,5 0,25 1,3 1549 259 54 92 21/2 1 69 907,3 0,18 0,98 1540 259 55 92 21/2 572 909.057	5/6	30	004.002	_	1.6	1577			212	2	$\leftarrow$		5 /
9 45 890,7 0.27 1,4 1611	10	12	200,5		1,6	77 0			260	numer 18	-	1/	3/2
8 48 892.7 031 1.6 1609		16	890 7	0.20	14	1011			764	2	+	9/2	21/2
7 51 894.9 0.31 ).6 1600 258 52 95 3 6 54 897.1 0.29 1 5 1555 255 53 95 2/2 5 57 899.2 0.28 1.5 1550 258 54 94 2/2 4 60 901.3 0.27 1.5 1551 258 54 94 2/2 3 63 903.40.26 ].4 1550 256 54 92 2/2 2 66 905.5 0.25 1.3 1549 259 54 92 2/2 1 69 907.3 0.18 0.98 1540 259 55 92 2/2 505-21: HCl, Cle by EPA Method 260	9	48	8927	031	1/	1609			166		- 1	95	7
6 54 897.1 0.29 1 5 1555 255 53 95 2/2 5 57 899.2 0.28 1.5 1550 258 54 94 2/2 4 60 901.3 0.27 1.5 1551 258 54 94 2/2 3 63 903.40,26 1.4 1550 256 54 92 2/2 2 66 905.5 0.25 1.3 1549 259 54 92 2/2 1 69 907.3 0.18 0.98 1540 259 55 92 2/2 Stor 72 909.057 250 250 250 250 250 250 250 250 250 250	5	51	2949	2		1600			258	5	7.	95	3
S 57 899. 2 0,28 1.5 1550 258 54 94 21/2 4 60 901.3 0,27 1.5 1551 258 54 94 21/2 3 63 903,40,26 3,4 1550 250 54 92 21/2 2 66 905,5 0,25 1,3 1549 259 54 92 21/2 1 69 907,3 0.18 0.98 1540 259 55 92 21/2 Star 72 909.057 21;11 8050	6	54	397.1	0.29	15	1555			255	5	3	95	21/2
3 63 903, 40, 26 1, 4 1550 256 54 92 272 2 66 905, 5 0, 25 1, 3 1549 259 54 92 272 1 69 907, 3 0.18 0.98 1540 259 55 92 272 572 909.057 27;11 909.057	5	57	899.2	0,28	1.5	1550			258	5	-	44	01/
2 66 905,5 0,25 7,3 1549 259 54 92 272 1 69 907,3 0.18 0.98 1540 259 55 92 272 Stor 72 909.057 27;111	4	60	901.3	0,27	1.5	155]			258	54	-	94	21/2
1 69 907.3 0.18 0.98 1540 259 55 92 2/2 Stor 72 909.057 27;11 20 20 20 20 20 20 20 20 20 20 20 20 20	3	63	403.4	0,26	1,4	1550			250	52	Ĺ	92	21/2
Stor 72 909.057  Notes:  SDS-21: HCl, Cl2 by EPA Method 26A	2	66	905,5	1 4	10	1549			259	54	-	92	2/2
Notes:	-1	69	0 / 1 -	0.18	0.98	1540			259	53	7	42	2/2
SDS-21: HCl, Cl <sub>2</sub> by EPA Method 26A	STOR	7.4	909.051										
SDS-21: HCl, Cl <sub>2</sub> by EPA Method 26A	' =	~ / 9 / P									_		
SDS-21: HCl, Cl <sub>2</sub> by EPA Method 26A	-										-		
SDS-21: HCl, Cl <sub>2</sub> by EPA Method 26A	Notes:												
Issued: January 201.										- <i>5</i> L	)S-21:	P	er EM 50P-021

Sample Type	HCI/CI 2	EPA Method	26A D	ate 5/	6/19		Nozzle D	ia 0,37	5	Page		of /
Project Name	GCO Stack	Tests	Co	ond	Run 2	>	Baromet	er Wenth	el	Т	rain Leak Rat	:e (cfm @ "Hg)
Project Number	60542107	_	Co	onsole ID	25-00		Bar. Pres		7	Initial	0	e /17"
Facility	SunCoke E	nergy GCO	ΔΙ	н@	015		Stat. Pre ("H <sub>2</sub> O)	ss0.3		Final	0	e 6"
Source	ByPass Ve	nt Stack #5	Kf				Probe ID	17045	702	Pitot	Tube Leak Cl	neck ("H <sub>2</sub> O@"H <sub>2</sub> O)
Operator	WOT	140/51	O D	GMCF 0	971		Pitot ID			Initial (-		e 3.5
Duct Dime	nsion(s)	9"	Fil	lter No.			PTCF	0.83		Initial (+	) /	r @ A"
Nozzle Cali	bration				>		Meter Elevation	n (ft) 1	n	Final (-)	1	/e 4"
Caliper ID			/	<u> </u>	_ ~ _	- 7.	(relativeto Baromete	41	0	Final (+)	V	e 41
Point	Clock Time	DGM Reading	<b>ΔP</b> ("H₂O)	ΔH ("H₂O)				Temperature (°				Vacuum ("Hg)
	Clock Time	(ft³)	000	1 (120)	Stack		robe 1 248-273	Filter Target 248-273	Imp Ex Target <		DGM Outlet	
B12	0	912.830	0.30	108	1217	14	A	250	64		100	3
11	3	915.6	0.27	1,9	1045			253	60	>	100	3
10	12	911,8	129	7. 1	1063			26-2	50	7	101	3
0	17	922 7	0.29	2.1	1211			200	59	-	101	7
5	15	9253	0.32	20	1227			7/12	1 1		102	21/2
1	18	9276	0.30	10	1201			259	61		103	12
5	21	930 1	0.38	23	1392		-	25/0	62	-	102	4
4	24	932.7	0.35	2.0	1398		Y: (1)	252	62		105	31/2
3	27	935,1	0.90	2.3	1430			252	62	?	105	A
2	30	9371	0.29	1.60	1382			256	63		106	3
	33	939,9	0.20	1.1	1350			250	63	,	106	2
Stop	36	941.687			,		N.					
AIZ	36	941,908	0.29	1,7	1407			253	68		105	3
11	39	944,1	0.28	1,7	1403			261	67		105	3
18	42	946,3	0.34	2.0	1407			250	50		100	3/2
9	45	948.7	0.39	23	1585			200	50	7 /	107	4
8	48	951,3	0,30	1.8	1354			200	56	2	107	3/2
10	3/	953.6	0.31	1,6	1306			704	24	2	100	3
5	27	9501	0.29	1.9	1595			252	20	7	109	3/2
4	60	9604	0.25	10	1295			767	74	7	117	3
3	63	962.6	0.26	16	1287			250	3/		110	
2	66	964.8	0.18	12	1265			267	56	2	111	3
Ĭ	69	967.0	0.13	0.85	1200			253	56	,	111	2
Stop	72	968.742			1600						,	
•	15.04											
	14:58	3								1		
Notes:												
	*								– <i>50</i>	S-21:	ρ	PA Method 26A ler EM SOP-021 : January 2017

ı			
GCO Stack Tests	60542107	5/5/17	ByPass Vent Stack #5
Project Name	Project Number	Date	Source

### HCI/CI2 EPA Method 26A

	A	Srow 110-01	1
Condition No.	Run No.	Balance ID	Recovered by

# Moisture Determination

Imp No.	Contents	Vol (mt)	Vol (mt)   Configuration   Initial Wt (g)	Initial Wt (g)	Final Wt (g)
1	0.1 N H₂SO₄	100	5/9	7/6.5	3045
2	0.1 N H <sub>2</sub> SO₄	100	9/5	6253	6299
3	Water	100	Mod	131.7	633,8
4	Silica Gel	~200g	Mod	928.1 937,2	937,2

### Sample Log

-M26A-Acdimp 1 L Nalgene Acid Impinger Catch & Rinse Alkaline Impinger Catch & Rinse Alkaline Impinger Catch & Rinse		Sample ID Number		Sample Container	Description
500 mL Nalgene	500 mL Nalgene	N-	126A-AcdImp	1 L Nalgene	Acid Impinger Catch & Rinse
		7	426A-Alkimp	500 mL Nalgene	Alkaline Impinger Catch & Rinse

# Sample Recovery Checklist

<ul> <li>(Only if transfer line is used). Disconnect transfer line, and rinse three times with DI water into acid impinger catch bottle. Transfer bottle to laboratory with impinger</li> </ul>	irain
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- Using water, rinse filter support, back half of filter holder and any connecting glassware into the acid impinger catch bottle.
- Disassemble sample train, wipe off excess water and weigh each impinger. Record the final weights in the Moisture Determination section of this data sheet.

Note condition of the silica gel impinger. \_\_\_\_% spent

- Pour contents of the 1st, 2nd <del>and 3rd</del> (containing acid) impingers into the Acid impinger catch bottle(s). Rinse impingers and connecting glassware with deionized water into the same bottle(s). Complete acid impinger sample label.
- Pour the contents of the 4th and 5th impingers (containing NaOH) into the alkaline impinger catch bottle(s). Rinse impingers and connecting glassware with deionized water into the same bottle(s). Complete alkaline impinger sample label.

Log samples into logbook and store appropriately.

Notes:		

RDS-19; HCI/Cl<sub>2</sub> by EPA Method 26A Per EM SOP-021 Issued: August 2016

GCO Stack Tests	60542107 /	5/5/17	BvPass Vent Stack #5
Project Name	Project Number	Date	Source

### HCI/CI2 EPA Method 26A

	7		X
Condition No.	Run No.	Balance ID_	Recovered by

# Moisture Determination

(g) Final Wt (g)	S 850.7	1.187 8.577	(51,2 652.9	872,4 879,0	
Initial Wt	74.3	777.	(51,2	4,028	
Vol (mt) Configuration Initial Wt (g)	S/9	9/5	Mod	Mod	
Vol (mL)	100	100	100	~200g	
Contents	0.1 N H <sub>2</sub> SO <sub>4</sub>	0.1 N H₂SO₄	Water	Silica Gel	
Imp No.	1	2	ю	4	

### Sample Log

Sample Description	-M26A-AcdImp 1 L Nalgene Acid Impinger Catch	19 500 mL Alkaline Impinger Nalgene Catch & Rinse	
Sample ID Number	-M26A-AcdIn	-M26A-Alkimp	

# Sample Recovery Checklist

(Only if transfer line is used). Disconnect transfer line, and rinse three times with DI water into acid impinger catch bottle. Transfer bottle to laboratory with impinger

Using water, rinse filter support, back half of filter holder and any connecting glassware into the acid impinger catch bottle.

Disassemble sample train, wipe off excess water and weigh each impinger. Record the final weights in the Moisture Determination section of this data sheet.

Note condition of the silica gel impinger. \_\_\_\_% spent

Pour contents of the 1st, 2nd <del>and 3rd</del> (containing acid) impingers into the Acid impinger catch bottle(s). Rinse impingers and connecting glassware with deionized water into the same bottle(s). Complete acid impinger sample label.

Pour the contents of the 4th and 5th impingers (containing NaOH) into the alkaline impinger catch bottle(s). Rinse impingers and connecting glassware with deionized water into the same bottle(s). Complete alkaline impinger sample label.

Log samples into logbook and store appropriately.

RDS-19; HCI/Cl<sub>2</sub> by EPA Method 26A Per EM SOP-021 Issued: August 2016

		7	
	•	5/6/17	) ,
GCO Stack Tests	60542107	5/5/17 124	Rubace Vont Stack #5
Project Name	Project Number	Date	Source

### HCI/CI2 EPA Method 26A

	$\omega$		75
Condition No.	Run No.	Balance ID	Recovered by

# **Moisture Determination**

Imp No.	Contents	Vol (mL)	Vol (ml) Configuration Initial Wt (g)	Initial Wt (g)	Final Wt (g)
1	0.1 N H <sub>2</sub> SO <sub>4</sub>	100	6/5	9868 8'8/	8336
2	0.1 N H <sub>2</sub> SO₄	100	S/5	626,4 630,0	630,0
3	Water	100	Mod	633.6	635.3
4	Silica Gel	~200g	Mod	923.3 9345	9345

### Sample Log

Sample ID Number		Sample Container	Description
Ŧ	-M26A-AcdImp 1 L Nalgene	1 L Nalgene	Acid Impinger Catch & Rinse
	-M26A-Alkimp	500 mL Nalgene	Alkaline Impinger Catch & Rinse

# Sample Recovery Checklist

(Only if transfer line is use water into acid impinger c train.	(Only if transfer line is used). Disconnect transfer line, and rinse three times with DI water into acid impinger catch bottle. Transfer bottle to laboratory with impinger train.
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Using water, rinse filter support, back half of filter holder and any connecting glassware into the acid impinger catch bottle.

Disassemble sample train, wipe off excess water and weigh each impinger. Record the final weights in the Moisture Determination section of this data sheet.

Note condition of the silica gel impinger. \_\_\_\_% spent

Pour contents of the 1st, 2nd and 3rd (containing acid) impingers into the Acid impinger catch bottle(s). Rinse impingers and connecting glassware with deionized water into the same bottle(s). Complete acid impinger sample label.

Pour the contents of the 4th and 5th impingers (containing NaOH) into the alkaline impinger catch bottle(s). Rinse impingers and connecting glassware with deionized water into the same bottle(s). Complete alkaline impinger sample label.

Log samples into logbook and store appropriately.

Notes:	

RDS-19; HCI/Cl<sub>2</sub> by EPA Method 26A Per EM SOP-021 Issued: August 2016

Sample Type <b>C</b>	ontrolled Co	ndensation; H <sub>2</sub> S	O <sub>4</sub> /SO <sub>2</sub> Dat	e 5/5/20	)I7 Ope	erator J/F	-	Page	/ of	
Project Name	GCC	Stack Tests	Cor	ndition	Bar	rometer ID	THE STATE OF THE S	Train	Leak Rate (cfn	m@"Hg)
Project Number	6	0542107	Run	· ·	("H <sub>€</sub>	r. Press. 30°	K	Initial (),	005 e	12.5
Facility	Sund	coke Energy	Con	nsole ID K Ridge-URS	5-005	>>		Final O.		5,5
Source B Duct Dimension(s)	0	Stack #5		MCF 0. 981	(rela	eter vation (ft) ative to ometer)			><	<
Coil ID	Clock Time	DGM Reading	All wu o			emperature (°			Vacuum	
COILID		(ft³)	ΔH ("H₂O)	Probe (if used) Target 600	Filter or IGS Target 550	Cond Exit	Imp Exit Target <68	DGM	("Hg)	O <sub>2</sub> (%)
	16:50	486.462	0.30	625	610	149	65	97	8.0	
	16:55	488.17	0.30	613	636	149	63	97	8.0	11.8
	17:00	489.90	0.30	615	630	150	63	97	8.0	
	17:05	491.60	0.30	621	633	141		97	0.8	
	17:10	493.32	0.30	621	617	142	59	98	8.0	10.4
	17:15	495.18	0.30	627	599	142	52	99	8.0	
	17:20	496.90	0.30	626	608	142	52	100	80	9.8
	17:25	498.52	0.30	615	608	141	51	99	8.0	
	17:30	500.22	0.30	624	633	142	51	99	8.6	
	17:35	501.95	0.30		606	140	50	99	8.0	9.9
	17:40	503.67	0.30	613	618	143	50	99	8.0	
	17:45	505.42	0.30	627	603	142	50	100	8.0	
	17:50	507.155								
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Notes: A	0.02	- 1								
Notes: 🔼	H 0.3	, I Hour	cho.				-	10		
							5DS-34: 	H <sub>2</sub> 50 <sub>4</sub> /50 <sub>2</sub> E	Per E	EM 50P-066
		1:			61		_		Issued: Fe	bruary 2017

Sample Type Co	ontrolled Co	ndensation; H₂S	O <sub>4</sub> /SO <sub>2</sub> Dat	e 5/5/201	7 Op	erator JNF		Page	<b>L</b> of	
Project Name	GCC	Stack Tests		ndition		rometer ID	۱ و	Train	Leak Rate (cfr	m@"Hg)
Project Number	6	0542107	Rur	2:	Bai ("H	r. Press.	401	Initial O.	003 @	17.5
Facility	Sun	coke Energy	Cor	isole ID K R: 130-URS			<<	_		17.0
Duct Dimension(s)	pass vent	t stack #	5 DGI	O. 98/.	Me Ele (rel	eter vation (ft) ative to ometer)	11			
Coil ID	Clock Time	DGM Reading	Alluma			emperature (°			Vacuum	
		(ft³)	ΔH ("H <sub>2</sub> O) <b>5MF 5 5 </b> 17	Probe (if used) Target600	Filter or IGS Target 550	Cond Exit	Imp Exit Target <68	DGM	("Hg)	O <sub>2</sub> (%)
2	19:30	507,908	0.030		622	135	60	99	7.0	
	19:35	509.64	0.30	618	664	141	.49	99	7.0	
	19:40	511.35	0.30	624	627657		47	99	7.0	8.5
	19:45	513.03	0.30	619	645	142	46	100	7.8	
	19:50		0.30	613	635	143	46	101	7.0	2
	19:55	516.42	0.30	622	624	144	46	101	8.0	7.7
	20:00	518.15	0.30	620	610	143	46	(02	8.0	
	20:05	519.88	0.36	617	602	143	46	102	8.0	
	20:10	521.60	0.30	618	601	143	47	103	8.5	10.7
	20:15	523.34 525.07	0.30	615	610	143	47	103	8.5	
	20:20		0.30	614	613	143	48	104	8.5	
END	20:25	526.86 528.586	0,50	619	e L	143	48	104	8.5	7.6
DNU	20170	20,700								
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							SDS-34:	H2504/502 E	by Controlled C	ondensation
		*				2	_ / ·		Per E Issued: Fel	M 50P-066 bruary 2017
						A	- '			ĺ

Sample Type Co	ontrolled Cor	ndensation; H <sub>2</sub> S	O <sub>4</sub> /SO <sub>2</sub> Date	e 5/6/20	(7 Ope	erator JMF		Page	) of	J		
Project Name	GCO	Stack Tests	Con	dition		ometer ID	9	Train	Train Leak Rate (cfm@"Hg)			
Project Number	6	0542107	Run	5	Bar ("He	Press. 7	10	Initial O	002 @1	05		
Facility	Sund	coke Energy	Con	1.10			Final O.					
Source Bypass vent stack #5				DGMCF Meter								
Duct Dimension(s)	91	/		0. 981	(rela	ative to ometer)			><			
	T	DGM Panding			Te	mperature (°	:)		Vasuus			
Coil ID	Clock Time	DGM Reading (ft³)	<b>ΔH</b> ("H₂O)	Probe (if used) Target 600	Filter or IGS Target 550	Cond Exit	Imp Exit Target <68	DGM	Vacuum ("Hg)	O <sub>2</sub> (%)		
3-	13:22	529.305	0.30	619	627	141	60	106	5.5			
	13:27	531.10	0.30	617	637	140	58	106	6.0			
	13:32	532.80	0.30	620	629	143	56	106	5,5			
	13:37	534.50	0.30	625	604	145	56	106	6.0	13.7		
	13:42	536.19	0.30	622	601	144	57	106	6.0			
	13:47	537.95	0.30	615	601	144	57	106	6.0	12.3		
	13:52	539.78	0.30	620	596	143	57	106	6.0			
	13:57	541.33	0.30	619	631	144	57	107	6.0			
	14:02	543.08 544.73	0.30	615	613	143	57	107	6.0	11.8		
	14:07	546.44	0.30	618	600	143	58	108	6.0			
	14:12	548.14		623	606	139	58 57	108	6.0	10.0		
	14:22	549.852	0.30	617	605		37	108	6.5	12.8		
	14.00	J (1,0)Z		at T								
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					[k/]				issued: Fe	bruary 2017		

Sample Ty	rpe: Filt a	nd Cond PM (M5	/M202)	Date	7/8/	77	Nozzle Dia (in)	1011	Page	of	
Project Na	me GCO St	tack Tests		Cond	Run	1	Barometer D	22211	Tra	ain Leak Rate (cfr	n @ "Hg)
Project Nu	imber 60542	107		Console ID	URS	-001	Bar. Press. ("Hg	30.03	Initial	0.0030	1311
Facility	SunCo	ke Energy GCO		ΔН@ _	2.01	5	Stat. Press. ("H <sub>2</sub>	0) - 0.25	Final	0.0180	10"
Source	ByPass	Vent Stack #5		K <sub>f</sub>				04522	Pitot 1	Tube Leak Check	
Operator	WCT	HO/SP	<u> </u>	DGMCF (	0.95	71	Pitot ID		Initial (-)		4"
Duct Dime	nsion(s)	91		Filter No.			PTCF O. 8	33	Initial (+)	/ @	4
Nozzle Cali	ibration						Meter Elevation (relative to Baron	n (ft)	Final (-)	/ @	4"
Caliper ID			0.375	0.	371	0.375	1	450	Final (+)	✓ @	40
		DCM Parding					Temp	erature (°F)			
Point	Clock Time	DGM Reading (ft³)	ΔP ("H₂O)	<b>ΔH</b> ("H₂O)	Stack	Probe Target 248±25	Filter Target 248±25	CPM Filter* Target: near but <85	Imp Ex Target <	68 Outlet	Vacuum ("Hg)
D	0	971.208	0.18	1.0	1125	NA	232	83	62	95	11/2
**	3:30	973.178									
	3:30	973.884		1 1	1 - 6 hr		000	PT3	, ,	200	
05	15	974.7	021	1,4	1267		138	83	68	3 84	13,
3	10	977,9	0.21	1,4	1280		238	82	67	84	12/2
4	15	781.5	0.23	1,4	1281		240	82	64	85	12/2
1	20	984.4	0.05	1,5	1290		21	82	62		2/2
9	30	988.3	0,20	1,6	1200		245	82	61	85	2/2
0	30	991.8	0,21	1,8	1201		241	82	62	85	1
8	127	175,5	0.33	2.0	1334		211	82	64	86	3/2
10	110	1003,7	0,22	2,0	12247		250	84	00	88	17
10	43	10-21	0.5	20	1354	4	050	84	17	07	137
12	66	10117	0.38	23	1325		2217	85	05	3 95	1/2
Stand	60760	1016.117	v, 30	01/	15-17		1	00	60	1 10	14/2
CV	(0/)	1016,269	0.20	1,2	1220		149	36	67	97	R
11	65	1019.4	025	1.6	1247		241	86	50	7 90	包石
10	70	10230	0.28	18	1249		247	85	58	3 99	41/0
9	75	10267	0.28	1.8	1262		249	79	5	199	5
8	80	1030.4	0.28	1.8	1265		249	76	57	1 101	5/2
フ	85	1039.2	0.26	1,6	1279		245	76	58	3 102	5
6	90	1037.8	0.28	1.7	1319		255	77	60	104	5
5	95	1041.6	0.25	1.5	1318		253	8	63	3 104	5
4	100	1045,1	0,23	1.4	1327		243	84	64	- 104	4/2
3	105	1048.5	0,20	1,2	1324		247	83	62	104	4
2	110	1051.7	0.17	1.1	1298		251	81	61	103	3/2
	115	1054.7	0.10	0.60	1294		241	84	64	103	2/2
STOD	120	1057,114							8		
	17:49										
X											
Notes: /	ower Ji	5×@31	30 (1	3:28	:30)	· nesur	red (2)	* Remembe		5DS-36: PM (Filt	& Cond) by
15	10130	7.1				)		record Final Filter		Per: Ei	hods 5/202 M 50P-047
L								Temperatu	ıre	Issued: Nove	ember 2015

Source   Suppress vert Stack #5   Suppress vert Stack #6   Stack   Protect Different Suppress vert Stack #6   Stack   Protect Different Suppress vert Stack #6   Stack   Protect Different Suppress vert Stack   Protect Different Stack   Protect	Sample Type	e: Filt a	nd Cond PM (M5	/M202)	Date 5	18/1	7	Nozzle Dia (in)	0.375	Page	of	1
Project Number   60542107	Project Nam	ne GCO St	ack Tests		Cond	Run	2	Barometer 16		Trai	n Leak Rate (cfm	n @ "Hg)
SunCoke Energy GCO	Project Num	nber <b>60542</b> 1	107		Console ID	URS-	-001	1	29.92	Initial	0.0030	12"
Source   ByPass Vent Stack #5   No   Probe to   7704/522   Prot Tube Leak Check Find   Operator   W CV   10   Stack   Filter No.   Prot To   C   C   Stack   Institute to	Facility	SunCol	ke Energy GCO		ΔΗ@ /	2.015	)	Stat. Press. ("H	101-0,25	Final A		911
Operation   Oper	Source	ByPass	Vent Stack #5		Kr					Pitot Tu	be Leak Check	
	Operator	WCT	/HO/SP	>	DGMCF	0.971	al		•	-		41,
	Duct Dimens	sion(s)	91	,	Filter No.			PTCF O, S	33	Initial (+)		4"
Point   Clock Time   DGM Reading   AP (*No)   AH (*No)   Stack   Probe   Temperature (*)   Temperatu	Nozzle Calibi	ration				_		Meter Elevatio	n (ft)	Final (-)	<i>─</i>	4.
C12 O 058,146,0.23 1.4   226 N/A 239 83 61 79 1 1 1 1 1 1 1 2 1 2 1 1 2 1 2 1 1 2 1 2 1 1 2 1	Caliper ID			- -			\	2	150	Final (+)		4"
C12 O 058,146,0.23 1.4   206 N/A 239 83 61 79 1 1 1 5 68.4 0.26 1.6 133 245 77 55 79 58 79 1 1 1 5 68.4 0.26 1.6 133 245 77 65 79 78 8 20 72.0 031 1.9 139 247 76 62 78 78 8 20 72.0 031 1.9 139 247 76 62 78 78 8 20 79.0 03 2.0 1319 247 76 62 78 78 8 20 79.0 03 2.0 1319 247 76 62 78 78 8 20 79.0 03 2.0 1319 247 76 62 78 8 20 79.0 03 2.0 1364 247 76 59 78 8 20 27 20 23 1.5 125 240 76 59 78 2 2 20 76 59 78 2 20 1364 247 77 59 78 2 2 20 24 20 24 27 27 59 78 2 2 20 24 20 24 20 24 20 26 26 26 26 26 26 26 26 26 26 26 26 26		21:25						Temp	erature (*F)			T
C12	Point	Clock Time		<b>ΔP</b> ("H₂O)	<b>ΔH</b> ("H₂O)	Stack			Target: near	Imp Exit		Vacuun ("Hg)
11 5 61.5 0.27 1.7 1251 245 79 50 79 10 10 10 65.1 0.73 1.4 1230 246 78 61 78 1	CIZ	0	058,146	0.23	14	1226	NIA	239	83	101		21/2
10 10 (S.) 0.33 1.4 13.8 246 78 61 78 7 15 68.4 0.26 1.6 123 245 77 63 78 79 72 8 20 72.0 0.31 1.9 1291 242 77 65 79 78 63 78 78 78 78 78 78 78 78 78 78 78 78 78	11		11	007	17	1251	141	245	79	58	179	3/2
8 20 72.0 031 1.9 1291 242 77 63 78 8 20 72.0 031 1.9 1291 242 77 65 79 7 25 75.8 033 2.0 1319 247 76 52 78 6 30 79.9 025 1.5 275 240 76 59 78 2 35 83.3 0.32 2.0 1384 247 76 59 78 4 40 871 0.34 2.0 1364 247 76 59 78 3 45 991.0 031 78 1397 247 77 59 79 2 50 94.8 026 1.5 1411 241 75 59 79 1 55 98.4 0.77 0.97 114 243 77 58 79 2 50 102.412 0.22 1.4 1340 244 81 58 78 3 10 102.412 0.22 1.4 1340 244 81 58 78 3 70 103.6 0.24 1.4 1386 247 78 52 80 9 3 70 103.8 0.24 1.4 1386 247 78 52 80 9 3 10 10.3 12 0.25 1.4 1394 248 78 54 81 5 80 114.9 0.28 1.6 1905 247 78 55 82 7 90 122.0 0.30 1.7 1412 247 77 56 83 1 00 129.2 0.30 1.7 1412 247 77 56 83 1 00 129.2 0.30 1.7 1412 247 77 56 83 1 00 129.2 0.30 1.7 1449 245 84 62 82 1 100 129.2 0.30 1.7 1449 245 84 62 82 1 100 129.2 0.30 1.7 1449 245 84 62 82 1 100 129.2 0.30 1.7 1449 245 84 62 82 1 100 129.2 0.30 1.7 1449 245 84 62 82 1 100 129.2 0.30 1.7 1449 245 84 62 82 1 100 129.2 0.30 1.7 1449 245 84 62 82 1 100 129.2 0.30 1.7 1449 245 84 62 82 1 100 129.2 0.30 1.7 1449 245 84 62 82 1 100 129.2 0.30 1.7 1449 245 84 62 82 1 100 129.2 0.30 1.7 1449 245 84 62 82 1 100 129.2 0.30 1.7 1449 245 84 62 82 1 100 129.2 0.30 1.7 1449 245 84 62 82 1 100 129.2 0.30 1.7 1449 245 84 62 82 1 100 129.2 0.30 1.7 1449 245 84 62 82 1 100 129.2 0.30 1.7 1449 245 84 62 82 1 100 129.2 0.30 1.7 1449 245 84 62 82 1 100 129.2 0.30 1.7 1449 245 84 62 82 1 100 129.2 0.30 1.7 1449 245 84 62 82 1 100 129.2 0.30 1.7 1449 245 84 62 1 100 129.2 0.30 1.7 1449 245 84 62 1 100 129.2 0.30 1.7 1449 245 84 62 1 100 129.2 0.30 1.7 1449 245 84 65 82 1 100 129.2 0.30 1.7 1449 245 84 65 82 1 100 129.2 0.30 1.7 1449 245 84 65 84 65 82 1 100 129.2 0.30 1.7 1449 245 84 65 84 65 82 1 100 129.2 0.30 1.7 1449 245 84 65 84 65 82 1 100 129.2 0.30 1.7 1449 245 84 65 84 65 82 1 100 129.2 0.30 1.7 1449 245 84 65 84 65 82 1 100 129.2 0.30 1.7 1449 245 84 65 84 65 82 1 100 129.2 0.30 1.7 1449 245 84 65 84 65 82 1 100 129.2 0.30 1.7 1449 245 84 65 84 65 82 1 100 129.2 0.30 1.7 1449 245 84 65 84 65 82 1 100 129.2 0.30 1.7 1449 245 84 65 82	10	10	65,1	0.23	1.4	1230		246	78	7 1	178	3
## 20 72.0 031 1.9 1291 242 77 65 79  7 25 758 033 2.0 1319 247 76 62 78  6 30 79 9 025 1.5 1275 240 76 59 78  5 35 83.3 0.32 2.0 1384 247 76 59 78  4 40 87.1 0.34 2.0 1368 246 76 59 78  3 45 98.1 0.31 18 1897 247 77 59 79  2 50 94.8 0.26 1.5 1411 247 75 59 79  3 50 102.412 0.72 1.4 1348 244 81 58 78 3  4 25 1056 0.23 1.3 1375 248 78 50 79  3 70 109.8 0.24 1.4 1380 241 78 52 80  4 25 111.9 0.25 1.4 1394 243 78 54 81  5 90 114.9 0.28 1.6 140 246 78 54 82  7 90 122.0 0.30 1.7 1412 247 77 56 83  9 100 129.2 0.30 1.7 1412 247 77 56 83  9 100 129.2 0.30 1.7 1417 248 78 59 82  100 105 132.7 0.32 1.8 149 237 81 61 83 21  100 105 132.7 0.32 1.8 149 237 81 61 83 21  100 105 132.7 0.32 1.8 149 237 81 61 83 21  100 105 132.7 0.32 1.8 149 237 81 61 83 21  100 105 132.7 0.32 1.8 149 237 81 61 83 21  100 105 132.7 0.32 1.8 149 237 81 61 83 21  100 105 132.7 0.32 1.8 149 237 81 61 83 21  100 105 132.7 0.32 1.8 149 237 81 61 83 21  100 105 132.7 0.32 1.8 149 237 81 61 83 21  100 105 132.7 0.32 1.8 149 237 81 61 83 21  100 107 143.557 1.5 1431 242 35 65 82 180 180 180 180 180 180 180 180 180 180	9	15	68,4	0.26	1.6			245		63	- <del> </del>	31/-
7 25 75 8 0.33 2.0 1319 247 76 62 78 6 30 79 9 0.25 1.5 1275 240 76 59 78 5 36 83.3 0.32 2.0 1364 247 76 59 78 4 40 87,1 0.34 2.0 1368 246 76 59 78 3 45 9691.0 1.31 1.8 1.99 247 77 69 77 9 1 55 918 4 0.17 0.99 124 243 77 59 79 1 55 918 4 0.17 0.99 124 243 77 58 79 79 2 50 101,122 1 60 102,412 0.22 1.4 1348 244 81 58 78 3 2 65 1056 1.23 1.3 1375 248 78 50 1.9 3 70 109,8 0.24 1.4 1386 247 78 52 80 7 4 25 111.9 0.25 1.4 1394 248 78 54 82 9 5 116,4 0.28 1.6 1401 246 78 54 82 7 90 122.0 0.30 1.7 1437 246 78 59 82 100 129,2 0.30 1.7 1437 246 78 59 82 10 105 132.7 0.32 1.8 149 237 81 61 83 1 10 105 132.7 0.32 1.8 149 237 81 61 83 1 10 105 132.7 0.32 1.8 149 237 81 61 83 1 10 107 136.3 0.30 1.7 1437 246 78 59 82 10 107 137,507 1.5 1431 242 85 65 82	8	20	72.0	0.31	1.9			242	77	65		A
## S	7		75.8	0 33	2.0	1319		247	76	62	78	15
\$\frac{\frac	6	30	79.9	0.25	1.5	1275		240	76	59	78	4
3 45 9 9 10 0 23 1 18 1897 247 77 59 79 2 2 50 9 4 8 0 36 1.5 14 11 340 24 7 5 59 79 1 1 55 9 8 4 0 .7 7 0 9 7 1 1 1 1 1 1 2 2 1 1 1 1 1 1 2 1 2 1 1 1 1 1 1 1 2 1 2 1 1 1 1 1 1 1 2 1 2 1 1 1 1 1 1 1 1 2 1 2 1	5	35	83.3	0,32	2.0	1384		247	7/2	59	78	15
2 50 94.8 0.36 1.5 14 11 24 75 59 79 1 1 55 918.4 0.17 0.97 124 243 77 58 79 59 79 1 1 55 918.4 0.17 0.97 124 243 77 58 79 59 79 50 102.412 0.22 1.4 1340 244 81 58 1/8 3 1/8	4	40	871		2.0	1368		246	76	59	78	6
SS 918.4 0.17 0.97 174 243 77 58 79 5		45	9091.0	0.31	18	1397		247	クワ	59	ック	5/2
DI 60 102,412 0.22 1.4 1340 244 81 58 78 3  2 65 103.6 0.23 1.3 1375 248 78 50 79  3 70 108,8 0.24 1.4 1386 247 78 52 80  4 25 111.9 0.25 1.4 1394 248 78 54 81  5 80 114.9 0.28 1.6 1401 246 78 54 82  7 90 122.0 0.30 1.7 1412 247 77 56 83  8 95 125.6 0.21 1.6 1407 248 77 56 83  9 100 129.2 0.30 1.7 1437 246 78 59 82  10 105 132.7 0.32 1.8 1449 237 81 61 83 12  12 115 140.0 0.27 1.5 1431 242 85 65 82  10 107 143.557 864 62 82  10 107 143.557 868 87 88 88 88 88 88 88 88 88 88 88 88 88	2	50	94.8	0.26	1.5	14 m		249	75	59	179	4/2
10	a	55	98.4	0.17	0.97	1264		243	フワ	58	29	3/2
2 (5 105.6 0.23 1.3 1375 248 78 50 79 3 70 108.8 0.24 1.4 1386 247 78 52 80 4 25 111.9 0.25 1.4 1394 248 78 54 61 5 80 114.9 0.28 1.6 1401 246 28 34 82 7 90 122.0 0.30 1.7 1412 247 27 56 83 9 100 129.2 0.30 1.7 1437 246 78 59 82 10 105 132.7 0.32 1.8 1491 237 81 61 83 12 11 110 136.3 0.30 1.7 1491 245 84 62 82 12 115 140.0 0.27 1.5 1431 242 85 65 82  10 107  101:07  101:07  101:07  102:18 140.0 0.27 1.5 1431 242 85 65 82  101:07	200	60	101,122	7.5.5	, ,	10.16						
3 70 109,8 0,24 1,4 1386 247 78 52 80  4 75 111.9 0.25 1,4 1394 248 78 54 6] 5 80 114.9 0.28 1.6 1905 247 78 55 82 7 90 122.0 0.30 1,7 1412 247 77 56 83 9 100 129,2 0.30 1,7 1437 246 78 59 82 10 105 132,7 0.32 1.8 149 237 81 61 83 11 110 126.3 0.30 1,7 1449 245 84 62 82 12 115 140,0 0.27 1.5 1431 242 85 65 82  01:07	77,1	60	102,412	0.22	1.4	1340		294	8)	58		3/2
4 75 111.9 0.25 1.4 1394 248 78 54 8] 5 80 114.9 0.28 1.6 1409 246 78 54 82 6 85 118.4 0.28 1.6 1409 247 78 55 82 7 90 122.0 0.30 1.7 1412 247 77 56 83 8 95 125.6 0.21 1,6 1427 248 77 56 83 9 100 129.2 0.30 1.7 1437 246 78 59 82 10 105 132.7 0.32 1.8 149 237 81 61 83 11 110 126.3 0.30 1.7 1449 245 84 62 82 12 115 140.0 0.27 1.5 1431 242 85 65 82 10 120 143.557 86 86 82  *Remember to record Find CPM Filter Part Filter Per Filter Part Filter Per Filter Part Filter Per Filter Part Filter	2	67	105.6	0,00	1,3	1375		298	1/8	50	127	13
5 80 114.9 0.28 1.6 1409 240 78 34 82 6 85 118.4 0.28 1.6 1409 247 78 55 82 7 90 122.0 0.30 1.7 1412 247 77 56 83 95 125.6 0.29 1.6 1427 248 77 56 83 95 125.6 0.29 1.6 1427 248 77 56 83 9 100 129.2 0.30 1.7 1437 246 78 59 82 10 105 132.7 0.32 1.8 1449 237 81 61 83 51 10 110 136.3 0.30 1.7 1449 245 84 62 82 65 82 120 143.557 1.5 1431 242 85 65 82 120 143.557 1.5 1431 242 85 65 82 120 143.557 1.5 1431 242 85 65 82 120 143.557 1.5 1431 242 85 65 82 120 143.557 1.5 1431 242 85 65 82 120 143.557 1.5 1431 242 85 65 82	_3	10	108.8	0,24	1,4	1386		041	18	52		13
6 85 118,4 0.28 1,6 1909 247 78 55 82 7 90 122.0 0.30 1.7 1412 247 77 56 83 8 95 125,6 0.21 1,6 1427 248 77 56 83 9 100 129.2 0.30 1.7 1437 246 78 59 82 10 105 132.7 0.32 1.8 1449 23.7 81 6) 83 E 11 110 176.3 0.30 1.7 1449 245 84 62 82 12 115 140.0 0.27 1.5 1431 242 85 65 82 10 120 143.557 431 242 85 65 82 10 120 143.557 50 120 120 120 120 120 120 120 120 120 12	7	33	11/19	0.75	1,4	1394		248	78	54		3
7 90 122.0 0.30 3.7 1412 247 77 56 83 8 95 1256 0.21 1,6 1427 248 77 56 83 9 100 129.2 0.30 1.7 1437 246 78 59 82 10 105 132.7 0.32 1.8 1449 23.7 81 6) 83 E 11 110 126.3 0.30 1.7 1449 245 84 62 82 ( 12 115 140.0 0.27 1.5 1431 242 85 65 82 10 107 143,557 Sometiment of the second Find of the s	7	80	1/4.7	0.20	1,0	1401		246		54	82	14
9 100 129.2 0.30 1.7 1437 246 78 59 82 10 105 132.7 0.32 1.8 1449 237 81 61 83 E 11 110 136.3 0.30 1.7 1449 245 84 62 82 6 12 115 140.0 0.27 1.5 1431 242 85 65 82 12 12 143.557 2431 242 85 65 82 12 12 143.557 2431 242 85 65 82	27	99	118,4	0.00	1,6	1905		24)	78	55	82	A
9 100 129.2 0.30 1.7 1437 246 78 59 82 10 105 132.7 0.32 1.8 1449 237 81 61 83 E 11 110 136.3 0.30 1.7 1449 245 84 62 82 6 12 115 140.0 0.27 1.5 1431 242 85 65 82 12 12 143.557 2431 242 85 65 82 12 12 143.557 2431 242 85 65 82	6	20	1051	0.20	1.1	1407		24/2	27	56	83	5
10 105 32.7 0.32 1.8 1441 237 81 6) 83 E 11 110 136.3 0.30 1.7 1449 245 84 62 82 6 12 115 140.0 0.27 1.5 1431 242 85 65 82 10 01:07 20 143.557 2431 242 85 65 82 10 01:07 20 143.557 250 250 250 250 250 250 250 250 250 250	à	100	100.60	0.01	1,9	1401		20	17	50	10-	5
1) 110 136.3 0.30 1.7 1449 245 84 62 82 (2) 12 115 140.0 0.27 1.5 1431 242 85 65 82 (2) 120 143.557 (2) 1431 242 85 65 82 (2) 120 143.557 (2) 1431 242 85 65 82 (2) 143.557 (2) 1431 242 85 65 82 (2) 143.557 (2) 1431 242 85 65 82 (2) 143.557 (2) 1431 242 85 65 82 (2) 143.557 (2) 1431 242 85 65 82 (2) 143.557 (2) 1431 242 85 65 82 (2) 143.557 (2) 1431 242 85 65 82 (2) 143.557 (2) 1431 242 85 65 82 (2) 143.557 (2) 1431 242 85 65 82 (2) 1431 242 85 (2) 1431 242	10	100	1327	0.30	10	1451		020	78	27	62	5
12 115 140.0 0.27 1.5 1431 242 85 65 82  120 143.557 243 242 85 65 82  01:071 201:071	15	110	1363	0	10	141		016	81	6)	183	5/2
ol: 07  Ol: 07  Otes: X Idet of Sites Nozzle posence dyny  *Remember to record Final CPM Filter Per: FM SC  Per: FM SC  Per: FM SC	12	116	1400	7.50	1.6	1/2		0112	04	//		9
ptes: X I let of filter Nozzle posence dyny  *Remember to record Final CPM  Filter Per: FM SC  Per: FM SC	tan	120	143 557	0.01	1, 2	1-51		290	85	65	Dd	5
pites: X I let of filter Nozzle posenke dyny  *Remember to record Final CPM  Filter Per: FM SC  Per: FM SC		100	1000/								-	
ptes: X I let of filter Nozzle posence dyny  *Remember to record Final CPM  Filter Per: FM SC  Per: FM SC		01:07										
Pak Cheek SDS-36: PM (Filt & Corecord Final CPM Filter Per: FM SO		-1100										
Par FM SON												
Filter Per: FM SC	tes: 🗡	Inlet	of filter	Noz	zle p	Lypk	e dyn	h		to SDS	5-36: PM (Filt o	& Cond) by
	PTE	TIPAK	check		U_			J	Filter	- 1	Per: EN	SOP-047
Temperature Issued: November	V								ı emperatu	ie	Issued: Nover	nber 2015

Sample Type	Filt a	nd Cond PM (M5,	/M202)	Date 5	19/17		Nozzle Dia (in)	0.375	Page	) of	1
Project Nam	e GCO St	ack Tests		Cond	Run	3	Barometer 10	Neather	Tra	in Leak Rate (cfm	@ "Hg)
Project Num	ber <b>605421</b>	.07		Console ID	URS-	001	Bar. Press. ("Hg	29.89	Initial	0,005 @	11"
Facility	SunCok	e Energy GCO		ΔΗ@ /	2.019	2	Stat. Press. ("Hz		Final	0,005 @	711
Source	ByPass	Vent Stack #5		Kf			Probe ID / 7	04522	Pitot Ti	ube Leak Check ("	'H₂O@"H₂O)
Operator	WCT	/HO/ST	>	0.17			Pitot ID	1.00	Initial (-)	/ e	1"
Duct Dimens	ion(s)	91		Filter No.	200. 17. (4)		PTCF O.	83	Initial (+)	/, e	4"
Nozzle Calibr	ration			4	>		Meter Elevation (relative to Baron	n (ft)	Final (-)	V @	4"
Caliper ID			-	<b>/</b> _		<	(relative to baron	450	Final (+)	V @	4"
			0,27	1.6			Temp	erature (°F)			
Point	Clock Time	DGM Reading (ft³)	ΔP ("H₂O)	ΔH ("H <sub>2</sub> O)	Stack	Probe Target 248±25	Filter Target 248±25	CPM Filter* Target: near but <85	Imp Ex Target <6	it DGM 58 Outlet	Vacuum ("Hg)
DI	0	145.213		1.6	1298	NA	240	107	67	97	2
2	5	148,4	0,20	1.3	1280		247	106	66	, 97	21/2
3	10	151.4	0.22	1.4	1289		246	103	63	97	3
4	15	154.7	0.22	1.4	1302		254	102	64	97	3
5	20	198.0	0.25	1,6	1305		248	101	06	97-	3
6	25	161.5	0.25	1.6	1311	J. J. Jan.	242	98	67	97	3
7	30	165,2	0.28	1.7	1339	1775	255	96	68	, , ,	31/2
8	35	168.7	0.30	1,9	1339		237	91	60	98	4
	40	172.6	0.34	2.	1384		243	85	56	, 98	5
10	45	176,7	0.36	dit	1385		237	82	5-		5,
17	50	181,0	0.37	2,2	1388		247	79	5	1: /	5/2
12	5>	185,3	0.37	2.2	1387		252	80	5	5 97	5/2
STOD	60	189,442	1123	V A	10/1		0/0	120	10	2 0/	01
11/2	100	189.563	010	104	1200		22	100	60	7 96	3/2
10	50	196,5	0,26	1/	1280		001	97	91	15	7
9	55	200 2	0.25	1.6	1200		762	91	9-	9/2	1
8	80	203.7	0.27	19	1303		061	91	6	96	41/2
5	85	207.5	028	1.7	1350		241	88	62	99	11/2
6	90	211.2	0.28	1.7	1347		244	87	(0 F	97	4/2
5	95	24,9	0.25	1,5	1359		246	85	02	97	4
4	100	218.3	0.24	1.4	1354	9	239	85	60	96	4
3	105	221.7	0.20	1.1	1349		246	85	59	95	3.
2	110	225,0	0,19	1.1	1350		244	87	60	96	3/2
)	115		0,15	0.90	1296		237	88	60	97	3
Stop	120	230.463						g*			
	18:01										
								-			
lotes: X	Dansed	3:04 inti	5 runs	@-/:	3 <b>3</b> · 1	extarte	1441	* Remembe		DS-36: PM (Filt a	
					)			record Final ( Filter Temperatu	СРМ	EPA Metho	ods 5/202 SOP-047

GCO Stack Tests	60503939 Ра	6/17	THE STATE OF THE S
Project Name GCO S	Project Number 60	Date 5/	Course

# Particulate Matter (incl. Condensable) *EPA Method 5/202*

Run No.

Balance ID Stoy No.

# **Moisture Determination**

Contents Vol (mi	Vol (ml	٦	Vol (mL) Configuration Initial Wt (g)	Initial Wt (g)	Final Wt (g)
empty			к/о	3693	464.9
empty			Mod	4209	616.7
Water 100	100		Mod	741.8	760.0
Silica Gel ~300g	~300g		Mod	8294	853.7

### Filter

Filter ID Number

### Sample Log

Sample ID Number	Sample Container	Description
-M5/202-PNR	250 ml	Probe and Nozzle Rinse
-M5/202-Filt	Petri Dish	Filter
-M5/202-WtRns	1000 ml	Water Rinse
-M5/202-OrgRns	250 ml	Organic Rinse
-M5/202-CPMFilt	Petri Dish	CPM Filter

RDS-47 - PM and Condensables
by EPA Method 5/202
Per: EM SOP-047
Revision Date: March 2015

Notes:

	Sample Recovery Checklist
1	Rinse and brush probe and nozzle with acetone (three times) into PNR sample bottle.
1	Disconnect transfer line. Rinse with water (two times) into water rinse sample bottle. Rinse with acetone (one time) and hexane (two times) into the organic rinse sample bottle.
Ī	Transfer water from knockout impinger to second impinger. Ensure that water level is at least $1\mathrm{cm}$ above stem tip. Add water if necessary.
	Volume of water added:
	If all water in knockout impinger will not fit in second impinger, replace stem on knockout impinger. Ensure that the water level in the first impinger is at least 1 cm above stem tip. Add water if necessary.
	Volume of water added:
	Purge with nitrogen for one hour at >14 liters per minute. Record start and end times on the data sheet.
	Start Stop
	Separate filter holder and place filter in clean pre-rinsed glass petri dish. Complete Filt sample label.
	Rinse front half of filter holder with acetone (three times) into PNR bottle. Complete probe and nozzle rinse (PNR) sample label.
Ĩ	Rinse the back half of the filter holder and any connecting glassware with water (two times) into the water rinse sample bottle.
Î	Rinse the back half of the filter holder and any connecting glassware with acetone (one time) and with hexane (two times) into the organic rinse sample bottle.
Î	Separate CPM filter holder and place CPM filter in clean pre-rinsed glass petri dish. Complete CPM-Filt sample label.
Ť	Disassemble sample train, wipe off excess water and weigh each impinger. Record the final weights in the Moisture Determination section of this data sheet
	Note condition of the silica gel impinger% spent
I	Pour the contents of the first two impingers into the water rinse catch bottle(s). Rinse impingers, connecting glassware. And the front half of the CPM filter holder two times with water into the same bottles. Complete water rinse sample label.
1	Rinse the first two impingers, connecting glassware, and the front half of the CPM filter holder acetone (one time) and hexane (two times) into the organic rinse sample bottle(s)
Ť	Log samples into logbook and store appropriately.

Project Name	GCO Stack Tests
Project Number	6020333
Date	4/8/17

**ByPass Vent Stack #5** 

Source

# Particulate Matter (incl. Condensable) *EPA Method 5/202*

Condition No.

Run No.

Balance ID

Recovered by

## Moisture Determination

Imp No.	Imp No. Contents	Vol (mL)	Vol (mL)   Configuration   Initial Wt (g)	Initial Wt (g)	Final Wt (g)
1	empty		K/0	8 258	SHAR
2	empty		Mod	594.4	Start
ю	Water	100	Mod	695.3	1800
4	Silica Gel	~300g	Mod	81718	85.7
2					

### Filter

Filter ID Number

### Sample Log

Sample ID Number	Sample Container	Description
-M5/202-PNR	250 ml	Probe and Nozzle Rinse
-M5/202-Filt	Petri Dish	Filter
-M5/202-WtRns	1000 ml	Water Rinse
-M5/202-OrgRns	250 ml	Organic Rinse
-M5/202-CPMFilt	Petri Dish	CPM Filter

# Sample Recovery Checklist

Rinse and brush probe and nozzle with acetone (three times) into PNR sample bottle.

Disconnect transfer line. Rinse with water (two times) into water rinse sample bottle. Rinse with acetone (one time) and hexane (two times) into the organic rinse sample bottle.

Transfer water from knockout impinger to second impinger. Ensure that water level is at least 1 cm above stem tip. Add water if necessary.

Volume of water added:

725.5

If all water in knockout impinger will not fit in second impinger, replace stem on knockout impinger. Ensure that the water level in the first impinger is at least 1 cm above stem tip. Add water if necessary.

Volume of water added:

Purge with nitrogen for one hour at >14 liters per minute. Record start and end times on the data sheet.

Stop

Separate filter holder and place filter in clean pre-rinsed glass petri dish. Complete Filt sample

Rinse front half of filter holder with acetone (three times) into PNR bottle. Complete probe and nozzle rinse (PNR) sample label.

Rinse the back half of the filter holder and any connecting glassware with water (two times) into the water rinse sample bottle.

Rinse the back half of the filter holder and any connecting glassware with acetone (one time) and with hexane (two times) into the organic rinse sample bottle.

 Separate CPM filter holder and place CPM filter in clean pre-rinsed glass petri dish. Complete CPM-Filt sample label.

Disassemble sample train, wipe off excess water and weigh each impinger. Record the final weights in the Moisture Determination section of this data sheet

Note condition of the silica gel impinger. % spent

Note condition of the silica gel impinger. ——% spent

Pour the contents of the first two impingers into the water rinse catch bottle(s). Rinse

impingers, connecting glassware. And the front half of the CPM filter holder two times with water into the same bottles. Complete water rinse sample label.

Rinse the first two impingers, connecting glassware, and the front half of the CPM filter holder acetone (one time) and hexane (two times) into the organic rinse sample bottle(s)

Log samples into logbook and store appropriately.

Notes:

RDS-47 - PM and Condensables
by EPA Method 5/202
Per: EM SOP-047
Revision Date: March 2015

	Ь		
GCO Stack Tests	60503939	2/16/12	ByPass Vent Stack #5
Project Name	Project Number	Date	Source

# Particulate Matter (incl. Condensable) *EPA Method 5/202*

	N		75
Condition No.	Run No.	Balance ID	Recovered by

## Moisture Determination

Imp No.	Contents	Vol (mL)	Vol (mL) Configuration Initial Wt (g)	Initial Wt (g)	Final Wt (g)
1	empty		K/0	7698	6605
2	empty		Mod	7702	1.009
3	Water	100	Mod	756.1	C '98 4
4	Silica Gel	~300g	Mod	7965	8/8,5
2				,	

### Filter

Number	
Filter ID	

### Sample Log

Sample ID Number Con	Sample Container	Description
-M5/202-PNR 25	250 ml	Probe and Nozzle Rinse
-M5/202-Filt Petr	Petri Dish	Filter
-M5/202-WtRns 100	1000 ml	Water Rinse
-M5/202-OrgRns 25	250 ml	Organic Rinse
-M5/202-CPMFilt Petr	Petri Dish	CPM Filter

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•	•
PCOVOPY	VICTOVEL Y
	=
9	֡֝֝֝֝֝֝֝֝֝֝֝֝֝ ֓֡֞֞֞֞֞֞֞֞֞֞֩֞֞֩֞֞֩֞֞֩֞֞֩֞֡
Com	

	Rinse and brush probe and nozzle with acetone (three times) into PNR sample bottle.
	Disconnect transfer line. Rinse with water (two times) into water rinse sample bottle. Rinse with acetone (one time) and hexane (two times) into the organic rinse sample bottle.
•	Transfer water from knockout impinger to second impinger. Ensure that water level is at least 1 cm above stem tip. Add water if necessary,
	Volume of water added:
	If all water in knockout impinger will not fit in second impinger, replace stem on knockout impinger. Ensure that the water level in the first impinger is at least 1 cm above stem tip. Add water if necessary.
	Volume of water added:
	Purge with nitrogen for one hour at $>14$ liters per minute. Record start and end times on the data sheet.
	Start Stop
	Separate filter holder and place filter in clean pre-rinsed glass petri dish. Complete Filt sample Jabel.

Rinse the back half of the filter holder and any connecting glassware with water (two times) into the water rinse sample bottle.

Rinse the back half of the filter holder and any connecting glassware with acetone (one time) and with hexare (two times) into the organic rinse sample bottle.

Rinse front half of filter holder with acetone (three times) into PNR bottle. Complete probe and nozzle rinse (PNR) sample label.

Rinse the back half of the filter holder and any connecting glassware with acetone (one time) and with hexane (two times) into the organic rinse sample bottle.

Separate CPM filter holder and place CPM filter in clean pre-rinsed glass petri dish. Complete CPM-Filt sample label.

Disassemble sample train, wipe off excess water and weigh each impinger. Record the final weights in the Moisture Determination section of this data sheet

Note condition of the silica gel impinger. \_\_\_\_% spent

Pour the contents of the first two impingers into the water rinse catch bottle(s). Rinse impingers, connecting glassware. And the front half of the CPM filter holder two times with water into the same bottles. Complete water rinse sample label.

Rinse the first two impingers, connecting glassware, and the front half of the CPM filter holder acetone (one time) and hexane (two times) into the organic rinse sample bottle(s)

Log samples into logbook and store appropriately.

	nsables 1 5/202 OP-047 :h 2015
	RDS-47 - PM and Condensables by EPA Method 5/202 Per: EM SOP-047 Revision Date: March 2015
	17 - PM a by EP, Pa rision Da
	RDS-4
Notes:	

Sample Typ	<sup>pe</sup> Mult	i Metals (Met	thod 29)	Date 5	8/17		Nozzle	Dia 0. 3 9	16	Page	1 0	f
Project Name		GCO Stack Te	sts	Cond	Run	رسه .	Baromo	~ W	30		in Leak Rate (	
Project Number		60542107		Console ID	1R5-0	005	Bar. Pro	ess. 30,0		Initial	0.005	
Facility	Su	nCoke Energy	GCO	ΔН@	LAKEI	947	Stat. Pr			Final	0,008	
Source		Pass Vent Sta		K <sub>f</sub>	5,52	///	Probe	17045	·		ube Leak Chec	
Operator	11)0-	140/c	D	DGMCF A	47109	81	Pitot ID	11075		Initial (-)		3,6
Duct Dimension(	(c)	110/91	21		7710,1		PTCF	083		Initial (+)	-,0	3,8
Nozzle Calib			4				Meter	0.03		Final (-)		3,8
Caliper ID _			0.375	0.375	0,3	75	Elevation (relative Baromet	to 150	//	Final (+)	/	7
Point	Clock Time	DGM Reading	<b>ΔP</b> ("H₂O)	Allena			1	emperature (°				Vacuum
Polit		(ft³)		<b>ΔH</b> ("H₂O)	Stack	Target 2	be 248±85	Filter Target 248±25	imp Target	<b>Exit</b> t <68	DGM Outlet	("Hg)
DC12	13:25	550.215	0.27	1,40	1303			255	6	0	93	7.5
C 11/2			8 Pan	se-los	it power		Line	r broke	whe	1 b	lowers 1	c st
013		5/3/17				pou	er. F	Replaced	liner,	Nac	rleak V= 0	,003@15
<b>(9</b>	13:40	FC:	0 ~	4 .4	1.00			- : ! 6			0	
- 4,12	15:10:30	-		1,4	1275			240	6	7	83	7.5
CII	15:12	555, 86	0.30	1,7	1276			246	6	2	83	0.8
(9	15:187	558.77	0.29	1.6	1276			252	6		83	8.0
	1522	562,51	0.29	1,6	1285		21	265		2	84	8,0
<u>C8</u>	1532	566.25	0.31	1,7	1283			102260		>2	84	8.0
(6	1537	570.11	0.30	1.5	1 <b>2</b> %7			257		9	84	8,0
CS	157	577.60		1.3	1358			258 257	6	$\overline{}$	85	8.0
<u>C4</u>	1547	581.16	0,23	0,93	1349			250	6			6.5
3	1552	59,4,09	0.16	0,88	1330	10	/	254	61	7	86	4.5
C2	1557	586,85	0.13	0.70	1275	1	N.	257	61	,	90 .	
CI	1602	589,49	0,10	0,54		00/0	VI 2	25'5	6	5	92	3.5
END	1607	591,745	, , -			510				_	1 4	
·			Leak v	1= 6,00	e 16,0							
DI	1649	592,000	0.22	1.2	1177			255	6		99	7.0
D2	1654	595,27	0.23	1.3	1180			253	59		100	7.0
03	1659	598.70	0.24	1.3	1197			252	6		101	7.0
DY	1764	602,15	0,25	1.4	1216			260	6	-	103	80
DS	1709	605,82	0,25	1,4	1236			256	6		103	8.5
06	1714	609,37	0,25	1,4	1242			258	6	3	105	8,5
D7	1719	613,08	0,30	1,7	1273			257	6	3	107	10,0
D8	1724	616.71	0.29	1,6	1282			257	6		108	9,5
Da	1729	620.58	0,30	1,7	1297			257	6		108	10.0
DIO	1734	624,52	0,30	1,7	1310			257	63		109	10,0
DII	1739	628,49	0.32	1.8	1300			256	63		109	10.0
D12	1744	632,53	0,32	(,&	1317			255	65		109	10,0
	int 12		all the	way ;	in Stack.					5D.S-07	Metals by FD	Method 2
Notes Po END	1749 Potential	636.5	all the 588 Shavi		in Stack.					5DS-07	Metals by EPA Per ( Issued: J	1 Method 29 EM SOP-017 anuary 2017

Sample Typ	<sup>oe</sup> Mult	i Metals (Met	hod 29)	Date 5/	8/2017		Nozzle (in)	Dia 0375		Page	1 c	f
Project Name		GCO Stack Te	sts	Cond	Run 2		Barome	wc		Tra	ain Leak Rate (	cfm @ "Hg)
Project Number		60542107		Console ID	2- URS- 00	کز	Bar. Pro	ess. 29,92	)	Initial	0,008	12,5
Facility	Su	nCoke Energy	GCO	ΔН@	947		Stat. Pr ("H₂O)	ess. 0, 25	/	Final	0.0	
Source	Ву	Pass Vent Sta	ck #5	K <sub>f</sub> S	53		Probe	17045		Pitot T	ube Leak Che	
Operator	SMF			DGMCF O			Pitot	17017		Initial (-)	T	9 H
Duct Dimension		91			707		PTCF	0.83		Initial (+)		<u> </u>
Nozzle Calil							Meter		_	Final (-)		9 4
Caliper ID _						92	Elevation (relative Baromet	to 7 2		Final (+)		9 <i>U</i>
		DCM D di					1	emperature (°	F)			
Point	Clock Time	DGM Reading (ft³)	<b>ΔP</b> ("H₂O)	<b>ΔH</b> ("H₂O)	Stack	Target	obe 248±25	Filter Target 248±25	Imp Targe		DGM Outlet	Vacuum ("Hg)
di	21:25	638,145	0.10	0,56	(726)	KL,	138	251	Š		78	2.0
<u>d2</u>	21:30	640.35	0,11	0.88	1105	07	ade	257	5	4	78	3.0
43	21:35	643,06		1,40	1162	प्र		256	5	3	78	5,5
44	21:40	646.42	0,25	1,60	1202			258	56		78	6,5
45	21:45	650,07	0.26	1,20	1250			254	5 7		78	7.0
46	21150	653.47	0,22	1,40	1318			255		7	78	6.0
47	21:55	656.88		1.60	1262			254	58		78	6.5
48	211.06	660,72	0.19	1.10	1297			257	S		78	4,5
19	22:05	663,66		1,10	1354			254	59		78	2.0
911	22:10	669,08	0,10	0,58	1368			255	59		77	2,5
7	22:20	671.34	0.10	0,58	1390	1		255	5			3 G
O 12	22:25	674889	0,50	1.70 Leale	- TMP	000	. 6 1	258	57		80	£8,0
CIZ	CO:07	675,148	0.28	1,60	1369	,009	) (G) 1	2,5 — 257	6	-2	7/	8.0
CIL	00:12	678.88	0,27	1.50	1381			264	5		76 76	8.0
CIO	00:17	68234	0.22	1,20	1380			261	5		77	6.5
09	00.22	685.63	0.23	1,3	1384			259	56		78	7,5
(8	00:27	687.28	0.23	1.30	1400			254	59		78	7,5
C7	00:32	689,98	0.30	1,60	1409			258	5	>	75	8,0
(6	00:37	693,67	0.34	1,80	1517			261	59		80	10.0
CS	00142	697,53	0,34	1,80	1514			259	60		81	10,0
CY	00.47	701,43	0.34	08,1	1513			253	6	1	81	14,0
<i>C</i> 3	00:52	704,41	0,36	1.90	1506			255	6		81	10,5
CZ	00157	708.35	0,35	1,90	1502			254	6		28	10,5
CI	01:02	712,36	0.25	1.40	1310			251	63	5	85	8.0
540	01:07	715,954						فالمرسودة				a paragraphic Mill
							-					
								-				
												-
- 11	20.23	. 3			A							
lotes No	izzle br	olce of	port ch	range, H	ad to p	eplace	- 1	iner Nezz	Le_	SDS-0.	7 Metals by EP	A Method 2
0.	tool 1	1 Di		<b>S</b>	S = 1/20-02/10-	1	9	1 -1 -		er a	Issued: .	EM SOP-01 Tanuary 201
- 1 6	tantially	tetlon	Show	11-55	in sany		Brus			ياعيار	<u>r</u>	
						15	roke	n liner				

Broken liner,

Sample Ty	<sup>'pe</sup> Mult	i Metals (Me	thod 29)	Date 5	17	No (in)	zzle (	Dia 0,35	5	Page	1 0	f
Project Name		GCO Stack Te	ests	Cond	Run	Ba		chonge	Y	Tra	in Leak Rate (	cfm @ "Hg)
Project Number		60542107		Console ID	1RS-00		r. Pre	ess. 29, 8		Initial	0.01 @	15"
Facility	Su	nCoke Energy	, GCO	ΔН@ /	947	Sta	at. Pre	ess 12	5	Final	0.01 @	
Source	By	Pass Vent Sta	nck #5	Kf		Pro	obe	170452	1	Pitot T	ube Leak Chec	
Operator	FC-H			DGMCF ()	981_	ID Pit	ot	110130		Initial (-)		a 1"
Duct		0			-/01_	ID PTO	CF	000		Initial (+)		1 /
Dimension Nozzle Cali						Me	eter	(1,4)3				<u> 4"</u>
		-	9			(rel	vatio lative t	to / [	クト	Final (-)		9 4
Caliper ID _		T ====			_ \	Bar	omete			Final (+)		7
Point	Clock Time	DGM Reading (ft³)	<b>ΔP</b> ("H₂O)	ΔH ("H₂O)	Stack	Probe		emperature (°) Filter	Imp		DGM Outlet	Vacuum ("Hg)
	0	1710-1752	0,26	14	1313	Target 248±	±25	Target 248±25	Targe	et <68	94	1 1.67
C/2	0	7777772	0.26	154	1212					/	74	
CIZ	0	724.490	0.26	1,40	1315	11/1	1	961	64	/	96	3
11	5	728,13	0.28	1.50	1316	147	1	258	64	4	95	3
10	10	731.83	0.30	1.60	1308		$\dashv$	260	64		96	3
9,	15	735.52	0.29	1.60	1324	+		250	64		76	3
8	20	739.46	0.30	1.60	1331	_	$\neg$	260	64		96	3
7	25	743,38	0.31	1.70	1350	_		261	6.		96	
6	30	747.04	0.29	1.60	1394	_		260	65		96	3
5	35	750.69	0.31	1.70	1383			251	62		96	3
4	40	754.74	0.25	1.40	1384	_		260	63		97	3
3	45	758.31	0.25	1.30	1385	-		255	61		96	3
2	50	761.55	0.23	1.30	1370	æ		257	62		96	3
1	55	765.05	0.20	1.10	1355			253	61		96	3
	60	768,269			_	_		-	-		-	-
DI	(F)	768.455	0.23	1.20	1230	_		231	6	7	94	3
2	65	771.93	0.23	1.20	1242	-		229	63		95	3 3
-3	70	775.25	0.25	1.30	1258	will's		230	64	/	96	3
4	75	778.67	0.25	1.30	1250			232	65	5	96	3
5	80	782.11	0.25	1,40	1262			231	62		96	3
6		785,73	0.28	1.50	1287			230	59		96	3
7	90		0.30	1,60	1300	نعه		228	58		97	3
8		793.16	0.30	1,60	1304		_	229	60		97	4
9		796.97	0.32	1.70	1338		_	233	60		97	4
10			0.35	1.80	1344			232	59		98	4
//			0.35	1.90	1344			233	61		98	4
12			0.37	2.00	1358	d or	_	234	61		98	4
	120	313.250	-	END	RUN	-	_		-		-	
							+					
Notes										SDS-07	Metals by EPA	1 Method 29
											Pert	EM SOP-017

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;34 rol

Issued: January 2017

Project	
Name	GCO Stack Tests
Project	
Number	,60542107
Date	5/8/17
Source	
	ByPass Vent Stack #5

### Including Determination of PM Multi-Metals EPA Method 29

Condition No.	Run No.	Balance ID	Recovered TC
Cond No.	Run	Balan	Reco

### Filter

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ı	Ξ	
ı	3	
ı	Z	
ı	Filter ID Number	Н
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Н		
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Final Wt (g)

Initial Wt (g)

Vol (mt) | Configuration

Contents

Imp No.

Mod

Moisture Determination

7070

712.1

Mod

100

HNO<sub>3</sub>/H<sub>2</sub>O<sub>2</sub>

7

77.7

Mod

Empty

4

9/5

100

HNO<sub>3</sub>/H<sub>2</sub>O<sub>2</sub>

ന

Mod

100

KMnO<sub>4</sub> Soln

2

Mod

100

KMnO<sub>4</sub> Soln

9 7

Mod

~ 300g

Silica Gel

- ase

7/19, (

- R
- e

<sup>1</sup> Per the method, this first impinger is optional and may be excluded for sources with moisture catch anticipated to be less than 100 g (Section 8.1.3.2)

Sample Log

Probe and Nozzle Rinse - Acetone

250 mL

-M5/29-PNR-Ace

Description

Sample Container

Sample ID Number

Probe and Nozzle Rinse - Nitric Acid

250 mL

-M5/29-PNR-NA

Petri Dish

-M5/29-Filt

- (s)
- je.

Notes:  RDS-24; Metals by EPA M29, including PM Per EM SOP-017 Per EM SOP-017 Issued: January 2017	Empty Impinger Kinse Permanganate Impinger HCI Rinse of KMnO <sub>4</sub> Impinger		-M5/29-Perm 1 L -M5/29-HCIRns 250 mL
RDS-24; Metals by EPA M29, including PM Per EM SOP-017	HCI Rinse of KMnO₄ Impinger	250 mL	-M5/29-HCIRns
	Permanganate Impinger	11	-M5/29-Perm
Notes:	Empty Impinger Rinse	250 mL	-M5/29-EIR 250 mL
label. (Note, this is not required if there is no visible solid residue) Log samples into logbook and store appropriately.	Nitric Peroxide Impinger	11	-M5/29-NPI

Filter ID Number
Sample Recovery Checklist
Rinse and brush probe and nozzle with acetone into PNR-Ace bottle. Note – use teflebrush.
Rinse and brush probe and nozzle with $0.1\mathrm{M}$ Nitric Acid into PNR-NA bottle. Note: $\mathrm{U}$ Teflon brush.
Rinse the (optional) Teflon transfer line with 0.1M nitric acid into NPI bottle.
Separate filter holder and place filter in clean petri dish. Complete sample label.
Rinse front half of filter holder with acetone into PNR-Ace bottle. Complete PNR-Ace sample label.
Rinse front half of filter holder with $0.1\mathrm{M}$ nitric acid into PNR-NA bottle. Complete P sample label.
Disassemble sample train, wipe off excess water and weigh each impinger. Record the final weights in the Moisture Determination section.
Note condition of the silica gel impinger% spent
Pour contents of first 3 impingers into the Nitric/peroxide impinger (NPI) catch bottle Rinse the impingers, filter support, back-half of the filter holder and connecting glassware with 0.1 M nitric acid same bottle(s). Complete NPI sample label(s).
Rinse the 4 <sup>th</sup> (initially empty) impinger with 0.1 M nitric acid into the empty impinger rinse (EIR) bottle. Complete EIR sample label.
Pour the contents of the 5 <sup>th</sup> and 6 <sup>th</sup> impingers (permanganate impingers) into the permanganate impinger catch bottle (Perm). Rinse with both permanganate solution and DI water. Complete Perm sample labe!
Rinse the permanganate impingers with a total of 25 mL of 8N HCl into the same bott Rinse impingers with 200 ml DI water into the same bottle. Complete HCIRns sample label. (Note, this is not required if there is no visible solid residue)
Log samples into logbook and store appropriately.

Project Name	GCO Stack Tests
Project Number	60542107
Date	
Source	
	ByPass Vent Stack #5

# Multi-Metals EPA Method 29 Including Determination of PM

# Moisture Determination

Imp No.	Contents	Vol (mt.)	Configuration	Initial Wt (g)	Final Wt (g)
1	-1	ж	Mod		
2	HNO <sub>3</sub> /H <sub>2</sub> O <sub>2</sub>	100	Mod	707.9	897.2
3	HNO <sub>3</sub> /H <sub>2</sub> O <sub>2</sub>	100	6/5	700.1	712.9
4	Empty	310	Mod	603.0	5 409
5	KMnO <sub>4</sub> Soln	100	Mod	2146	713.7
9	KMnO <sub>4</sub> Soln	100	Mod	745	714.6
7	Silica Gel	~ 300g	Mod	879.8	856.5

<sup>&</sup>lt;sup>1</sup> Per the method, this first impinger is optional and may be excluded for sources with moisture catch anticipated to be less than 100 g (Section 8.1.3.2)

### Sample Log

Sample ID Number	Sample Container	Description
-M5/29-PNR-Ace	250 mL	Probe and Nozzle Rinse - Acetone
-M5/29-PNR-NA	250 mL	Probe and Nozzle Rinse - Nitric Acid
-M5/29-Filt	Petri Dish	Filter
-M5/29-NPI	11	Nitric Peroxide Impinger
-M5/29-EIR	250 mL	Empty Impinger Rinse
-M5/29-Perm	11	Permanganate Impinger
-M5/29-HCIRns	250 mL	HCI Rinse of KMnO₄ Impinger

4	4
4	ز
÷	2
5	4
-	4

# Sample Recovery Checklist

 Rinse and brush probe and nozzle with acetone into PNR-Ace bottle. Note – use teflon brush.  Rinse and brush probe and nozzle with 0.1 M Nitric Acid into PNR-NA bottle. Note: use Teflon brush.

Rinse the (optional) Teflon transfer line with 0.1M nitric acid into NPI bottle.

Separate filter holder and place filter in clean petri dish. Complete sample label.
 Rinse front half of filter holder with acetone into PNR-Ace bottle. Complete PNR-Ace

Rinse front half of filter holder with 0.1 M nitric acid into PNR-NA bottle. Complete PNR sample label.

sample label.

Disassemble sample train, wipe off excess water and weigh each impinger. Record the final weights in the Moisture Determination section.

Note condition of the silica gel impinger. \_\_\_\_\_% spent

Pour contents of first 3 impingers into the Nitric/peroxide impinger (NPI) catch bottle(s) Rinse the impingers, filter support, back-half of the filter holder and connecting glassware with 0.1 M nitric acid same bottle(s). Complete NPI sample label(s).

Rinse the 4th (initially empty) impinger with 0.1 M nitric acid into the empty impinger rinse (EIR) bottle. Complete EIR sample label.

Pour the contents of the 5<sup>th</sup> and 6<sup>th</sup> impingers (permanganate impingers) into the permanganate impinger catch bottle (Perm). Rinse with both permanganate solution and DI water. Complete Perm sample label

Rinse the permanganate impingers with a total of 25 mL of 8N HCl into the same bottle. Rinse impingers with 200 ml DI water into the same bottle. Complete HCIRns sample label. (Note, this is not required if there is no visible solid residue)

Log samples into logbook and store appropriately.

	RDS-24; Metals by EPA M29, including PM	Per EM SOP-017	Issued: January 2017
Notes:			

Project	
Name	GCO Stack Tests
Project	
Number	60542107
Date	dalin
Source	2111
	ByPass Vent Stack #5

# Multi-Metals EPA Method 29 Including Determination of PM

Condition
No.
Run No.
Balance ID
Postorious
by Value of the party of the pa

# Moisture Determination

Imp No.	Contents	Vol (mL)	Vol (mL) Configuration	Initial Wt (g)	Final Wt (g)
1	-1	r	Mod		
2	HNO <sub>3</sub> /H <sub>2</sub> O <sub>2</sub>	100	Mod	7/1/3	892,5
т	HNO <sub>3</sub> /H <sub>2</sub> O <sub>2</sub>	100	S/9	783,9	7,8,7
4	Empty	39)	Mod	606.9	6083
2	KMnO <sub>4</sub> Soln	100	Mod	712.9	7192
9	KMnO <sub>4</sub> Soln	100	Mod	717.9	713.5
7	Silica Gel	~ 300g	Mod	8222	838.3

<sup>&</sup>lt;sup>1</sup> Per the method, this first impinger is optional and may be excluded for sources with moisture catch anticipated to be less than 100 g (Section 8.1.3.2)

### Sample Log

Sample ID Number
-M5/29-PNR-Ace
-M5/29-PNR-NA
-M5/29-Filt
-M5/29-NPI
-M5/29-EIR
-M5/29-Perm
-M5/29-HCIRns

-	1	֚֚֚֚֚֚֚֡֝֜֜֝֜֜֝֜֜֓֓֓֓֓֜֓֓֓֓֓֓֓֓֓֜֓֜֓֜֓֓֓֓֓֡֓֜֜֜֓֓֡֓֜֓֡֓֜	

Filter ID Number
------------------

# Sample Recovery Checklist

- Rinse and brush probe and nozzle with acetone into PNR-Ace bottle. Note use teflon brush.
- Rinse and brush probe and nozzle with 0.1 M Nitric Acid into PNR-NA bottle. Note: use Teflon brush.
- Rinse the (optional) Teflon transfer line with 0.1M nitric acid into NPI bottle.
- Separate filter holder and place filter in clean petri dish. Complete sample label.
   Rinse front half of filter holder with acetone into PNR-Ace bottle. Complete PNR-Ace
- sample label.

  Rinse front half of filter holder with 0.1 M nitric acid into PNR-NA bottle. Complete PNR
- sample label.

  Disassemble sample train, wipe off excess water and weigh each impinger. Record the final weights in the Moisture Determination section.
- Note condition of the silica gel impinger. \_\_\_\_\_% spent
- Pour contents of first 3 impingers into the Nitric/peroxide impinger (NPI) catch bottle(s). Rinse the impingers, filter support, back-half of the filter holder and connecting glassware with 0.1 M nitric acid same bottle(s). Complete NPI sample label(s).
- Rinse the 4<sup>th</sup> (initially empty) impinger with 0.1 M nitric acid into the empty impinger rinse (EIR) bottle. Complete EIR sample label.
- Pour the contents of the 5<sup>th</sup> and 6<sup>th</sup> impingers (permanganate impingers) into the permanganate impinger catch bottle (Perm). Rinse with both permanganate solution and DI water. Complete Perm sample label
- Rinse the permanganate impingers with a total of 25 mL of 8N HCl into the same bottle. Rinse impingers with 200 ml Dl water into the same bottle. Complete HClRns sample label. (Note, this is not required if there is no visible solid residue)
- Log samples into logbook and store appropriately.

Notes:	
	- RDS-24; Metals by EPA M29, including PM
	Per EM 50P-017
	Tssied: January 2017

### Determination of Cyclonic Flow Preliminary Velocity/Temperature Traverse EPA Methods 1 and 2

P		A	
76	1 16	) W-	/adder
Xx		B	
			71

Project	GCO FCR lests
Project Number	60542107
Facility	GCO
Source	MRS6-#5 Stack
Operator	wct/SP
Date	5/2/17
Time	7 /
Pitot Tube	2
No.	
PTCF	

		_		
Console (or				
Temperature Readout) ID				
Barometric Pressure (" Hg	)			
Elevation (Relative to				
Barometer) (ft)				
Static Pressure (" wc)	-0,	3/		
Pitot Tub	e Leak Chec	k ("H₂O@	9"H₂O)	
Initial (-)	/	@	5	
Initial (+)	/	@	5	
Final (-)		@	6	
Final (+)		@	5	

Traverse Point	Yaw Angle (°)	Velocity Head (ΔP) (in. wc)	Temperature (°F)
AI	-10.5	0.26	1390
2	-17	0,18	1391
3	-16	0.23	1403
4	-20	0,27	1399
5	-21	020	1392
6	-16	0.17	1384
131	-18	0,30	
2	-15	0.31	1375
3	-20	0.32	1415
4	-24	0.29	1430
5	-18	0,26	1441
6	-17	0.24	1435

Traverse Point	Yaw Angle (°)	Velocity Head (ΔP) (in. wc)	Temperature (°F)
C1	-3	928	13
2	-10	0,29	1368
3	77	0.26	1385
4	-/6	0,27	1391
5	-22	0,24	1384
6	-24	0.22	1387
01	-13.5	2.29	1350
2	-20	0,28	1350
3	-21	0.26	1352
4	-21.5	0.22	1355
(5)	-25	0.23	1358
6	-16	0,18	

Average Yaw Angle:  $\frac{176}{100}$ . (This is the average of the absolute value of the measurements)

If the average yaw angle exceeds 20°, Method 2 is not applicable for the determination of gas velocity.

FDS-03C Cyclonic Flow Prelim VT Per EM 50P-011 & 50P-012 Issued: April 2017 Appendix D ANALYTICAL REPORTS



## **ANALYTICAL REPORT**

Job Number: 140-8122-1

Job Description: Suncoke - M5/M202

For:

URS Corporation 105 Mitchell Road, Suite 200 Oak Ridge, TN 37830

Attention: John Carson

Sowine of School

Approved for release Courtney M Adkins Project Manager I 5/30/2017 12:18 PM

Courtney M Adkins, Project Manager I 5815 Middlebrook Pike, Knoxville, TN, 37921 (865)291-3000 courtney.adkins@testamericainc.com 05/30/2017

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## **Definitions/Glossary**

Client: URS Corporation

Project/Site: Suncoke - M5/M202

TestAmerica Job ID: 140-8122-1

USI	IOSSATV
-	Journ

TEQ

Toxicity Equivalent Quotient (Dioxin)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
n	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)

05/30/2017

## **Method Summary**

Client: URS Corporation

Project/Site: Suncoke - M5/M202

TestAmerica Job ID: 140-8122-1

Method	Method Description	Protocol	Laboratory
202 InOrg CPM	Inorganic Condensable Particulate Matter	EPA	TAL KNX
202 Org CPM	Organic Condensable Particulate Matter	EPA	TAL KNX
5	Particulates	EPA	TAL KNX

#### **Protocol References:**

EPA = US Environmental Protection Agency

#### **Laboratory References:**

TAL KNX = TestAmerica Knoxville, 5815 Middlebrook Pike, Knoxville, TN 37921, TEL (865)291-3000

## **Sample Summary**

Client: URS Corporation Project/Site: Suncoke - M5/M202

TestAmerica Job ID: 140-8122-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
140-8122-1	R-2434 R1 M5 PARTICULATE FILTER	Air	05/10/17 00:00	05/16/17 13:05
140-8122-2	R-2435 R1 M5 ACETONE PROBE RINSE	Air	05/10/17 00:00	05/16/17 13:05
140-8122-3	R-2436 R1 M202 AQUEOUS FRACTION	Air	05/10/17 00:00	05/16/17 13:05
140-8122-4	R-2437 R1 M202 ACETONE/HEXANE ORGANIC FRACTION	Air	05/10/17 00:00	05/16/17 13:05
140-8122-6	R-2479 R2 M5 PARTICULATE FILTER	Air	05/10/17 00:00	05/16/17 13:05
140-8122-7	R-2480 R2 M5 ACETONE PROBE RINSE	Air	05/10/17 00:00	05/16/17 13:05
140-8122-8	R-2481 R2 M202 AQUEOUS FRACTION	Air	05/10/17 00:00	05/16/17 13:05
140-8122-9	R-2482 R2 M202 ACETONE/HEXANE ORGANIC FRACTION	Air	05/10/17 00:00	05/16/17 13:05
140-8122-11	R-2524 R3 M5 PARTICULATE FILTER	Air	05/11/17 00:00	05/16/17 13:05
140-8122-12	R-2525 R3 M5 ACETONE PROBE RINSE	Air	05/11/17 00:00	05/16/17 13:05
140-8122-13	R-2526 R3 M202 AQUEOUS FRACTION	Air	05/11/17 00:00	05/16/17 13:05
140-8122-14	R-2527 R3 M202 ACETONE/HEXANE ORGANIC FRACTION	Air	05/11/17 00:00	05/16/17 13:05
140-8122-16	R-2597 QC M5 PARTICULATE FILTER PB	Air	05/07/17 00:00	05/16/17 13:05
140-8122-17	R-2599 QC ACETONE/HEXANE PB	Air	05/07/17 00:00	05/16/17 13:05
140-8122-18	R-2600 QC M202 DI WATER PB	Air	05/07/17 00:00	05/16/17 13:05
140-8122-20	R-2601 QC M5/202 PARTICULATE FILTER RB	Air	05/09/17 00:00	05/16/17 13:05
140-8122-21	R-2602 QC M202 ACETONE RB	Air	05/11/17 00:00	05/16/17 13:05
140-8122-22	R-2603 QC M202 HEXANE RB	Air	05/11/17 00:00	05/16/17 13:05
140-8122-23	R-2604 QC M202 DI WATER RB	Air	05/11/17 00:00	05/16/17 13:05
140-8122-25	R-3001 QC M202 FB AQUEOUS FRACTION	Air	05/09/17 00:00	05/16/17 13:05
140-8122-26	R-3002 QC M202 FB ACETONE/HEXANE FRACTION	Air	05/09/17 00:00	05/16/17 13:05
140-8122-27	A-6253 MEDIA CHECK M5	Air	05/07/17 00:00	05/16/17 13:05

# **Job Narrative 140-8122-1**

#### Sample Receipt

The samples were received on May 16, 2017 at 1:05 PM. The samples arrived in good condition and properly preserved. The temperature of the cooler at receipt was 22.0° C.

#### **Quality Control and Data Interpretation**

Unless otherwise noted, all holding times, and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

#### **General Chemistry**

Total Particulates: The measurement of the mass of particulate matter trapped by the particulate filter and probe rinse derived from an M-5 sampling train was performed using SOP number KNOX-WC-0006 (based on EPA Methods 0050 and 5). Microfiber filters and 150 mL beakers are carefully inspected and tare weighed to constant weight. After sample collection, the filters are dried, and then carefully weighed to constant weight to determine the mass of particulate matter trapped on the filters. The acetone probe rinse solution is evaporated to dryness, and then weighed to constant weight to determine the total particulate mass collected in the rinse. The total particulate mass collected by an M-5 train is the sum of the particulate filter and the acetone probe rinse residue weights.

Particulate by Method 202 (December 2010): Samples derived from Method 202 require special handling. The CPE filters were extracted three times with water, which was then combined with the corresponding aqueous fraction. The filters were then extracted with hexane three times, and the extracts were combined with the solvent rinses. The aqueous fractions were then extracted three times with hexane, and the extracts were combined with the solvent rinses. The organic fractions, including the acetone and hexane reagent blanks, were air dried in a hood. The aqueous fractions, including the deionized water reagent blank, were simmered to near dryness, and then allowed to air dry.

Aqueous samples having a pH < 6 were reconstituted with boiled deionized water, and then titrated with 0.1N ammonium hydroxide to a pH 7 endpoint. The samples were again simmered to near dryness, and then allowed to air dry. Titration to a pH 7 endpoint was not required for samples with a pH of 6 or higher upon receipt. Where applicable, the contribution from added ammonia was calculated and subtracted from the residue weight to obtain the final result for the aqueous fractions.

Residual water from both the aqueous samples and the organic solvent samples were further air dried in a forced draft oven at 28°C before transferring them to a desiccator. The air dried samples were transferred to a desiccator and dried over calcium sulfate to constant weight.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

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Client: URS Corporation

Project/Site: Suncoke - M5/M202

TestAmerica Job ID: 140-8122-1

## **General Chemistry**

### **Analysis Batch: 11400**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-8122-3	R-2436 R1 M202 AQUEOUS FRACTION	Total/NA	Air	202 InOrg CPM	
140-8122-8	R-2481 R2 M202 AQUEOUS FRACTION	Total/NA	Air	202 InOrg CPM	
140-8122-13	R-2526 R3 M202 AQUEOUS FRACTION	Total/NA	Air	202 InOrg CPM	
140-8122-18	R-2600 QC M202 DI WATER PB	Total/NA	Air	202 InOrg CPM	
140-8122-23	R-2604 QC M202 DI WATER RB	Total/NA	Air	202 InOrg CPM	
140-8122-25	R-3001 QC M202 FB AQUEOUS FRACTION	Total/NA	Air	202 InOrg CPM	

### Analysis Batch: 11401

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-8122-4	R-2437 R1 M202 ACETONE/HEXANE ORGANIC	Total/NA	Air	202 Org CPM	
140-8122-9	R-2482 R2 M202 ACETONE/HEXANE ORGANIC	Total/NA	Air	202 Org CPM	
140-8122-14	R-2527 R3 M202 ACETONE/HEXANE ORGANIC	Total/NA	Air	202 Org CPM	
140-8122-17	R-2599 QC ACETONE/HEXANE PB	Total/NA	Air	202 Org CPM	
140-8122-21	R-2602 QC M202 ACETONE RB	Total/NA	Air	202 Org CPM	
140-8122-22	R-2603 QC M202 HEXANE RB	Total/NA	Air	202 Org CPM	
140-8122-26	R-3002 QC M202 FB ACETONE/HEXANE FRAC	Total/NA	Air	202 Org CPM	

## Analysis Batch: 11467

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-8122-1	R-2434 R1 M5 PARTICULATE FILTER	Total/NA	Air	5	
140-8122-2	R-2435 R1 M5 ACETONE PROBE RINSE	Total/NA	Air	5	
140-8122-6	R-2479 R2 M5 PARTICULATE FILTER	Total/NA	Air	5	
140-8122-7	R-2480 R2 M5 ACETONE PROBE RINSE	Total/NA	Air	5	
140-8122-11	R-2524 R3 M5 PARTICULATE FILTER	Total/NA	Air	5	
140-8122-12	R-2525 R3 M5 ACETONE PROBE RINSE	Total/NA	Air	5	
140-8122-16	R-2597 QC M5 PARTICULATE FILTER PB	Total/NA	Air	5	
140-8122-20	R-2601 QC M5/202 PARTICULATE FILTER RB	Total/NA	Air	5	
140-8122-27	A-6253 MEDIA CHECK M5	Total/NA	Air	5	

Client: URS Corporation

Project/Site: Suncoke - M5/M202

TestAmerica Job ID: 140-8122-1

Client Sample ID: R-2434 R1 M5 PARTICULATE FILTER

Date Collected: 05/10/17 00:00

Date Received: 05/16/17 13:05 Sample Container: Petri/Filter

**General Chemistry** 

Analyte Result Qualifier RL MDL Unit D Prepared Analyzed Dil Fac 0.500 Particulates, Total 0.500 mg/sample 05/20/17 10:04 34.9

Client Sample ID: R-2435 R1 M5 ACETONE PROBE RINSE

Date Collected: 05/10/17 00:00

Date Received: 05/16/17 13:05

Sample Container: Amber Glass 250ml - unpreserved

**General Chemistry** 

Analyte **MDL** Unit Result Qualifier RL D Prepared Analyzed Dil Fac Particulates, Total 0.500 8.01 0.500 mg/sample 05/20/17 10:04

Client Sample ID: R-2436 R1 M202 AQUEOUS FRACTION

Date Collected: 05/10/17 00:00

Date Received: 05/16/17 13:05

Sample Container: Amber Glass 500mL - unpreserved

**General Chemistry** 

Analyte Result Qualifier RL MDL Unit D Prepared **Analyzed** Dil Fac Inorganic Condensible 84.0 1.00 0.500 mg/sample 05/18/17 13:19 **Particulate Matter** 

Client Sample ID: R-2437 R1 M202 ACETONE/HEXANE

ORGANIC FRACTION

Date Collected: 05/10/17 00:00

Date Received: 05/16/17 13:05

Sample Container: Amber Glass 500mL - unpreserved

**General Chemistry** 

Analyte RL Result Qualifier MDL Unit D Prepared Analyzed Dil Fac 1.00 **Organic Condensible Particulate** 2.48 0.500 mg/sample 05/18/17 13:27

Matter

Client Sample ID: R-2479 R2 M5 PARTICULATE FILTER

Date Collected: 05/10/17 00:00

Date Received: 05/16/17 13:05 Sample Container: Petri/Filter

**General Chemistry** 

Analyte Result Qualifier RL MDL Unit D Prepared Analyzed Dil Fac Particulates, Total 0.500 80.4 0.500 mg/sample 05/20/17 10:04

Client Sample ID: R-2480 R2 M5 ACETONE PROBE RINSE

Date Collected: 05/10/17 00:00

Date Received: 05/16/17 13:05

Sample Container: Amber Glass 250ml - unpreserved

**General Chemistry** 

Analyte Result Qualifier RL MDI Unit ח Prepared Analyzed Dil Fac Particulates, Total 0.500 41.8 0.500 mg/sample 05/20/17 10:04

TestAmerica Knoxville

Lab Sample ID: 140-8122-1

Lab Sample ID: 140-8122-2

Lab Sample ID: 140-8122-3

Lab Sample ID: 140-8122-4

Lab Sample ID: 140-8122-6

Lab Sample ID: 140-8122-7

Matrix: Air

Matrix: Air

Matrix: Air

Matrix: Air

Matrix: Air

Matrix: Air

Client: URS Corporation

Project/Site: Suncoke - M5/M202

TestAmerica Job ID: 140-8122-1

Client Sample ID: R-2481 R2 M202 AQUEOUS FRACTION

Lab Sample ID: 140-8122-8 Date Collected: 05/10/17 00:00

Matrix: Air

Date Received: 05/16/17 13:05

Sample Container: Amber Glass 500mL - unpreserved

**General Chemistry** 

Analyte Result Qualifier RL MDL Unit D Prepared Analyzed Dil Fac Inorganic Condensible 69.3 1.00 0.500 mg/sample 05/18/17 13:19

**Particulate Matter** 

Client Sample ID: R-2482 R2 M202 ACETONE/HEXANE Lab Sample ID: 140-8122-9

ORGANIC FRACTION

Date Collected: 05/10/17 00:00 Matrix: Air

Date Received: 05/16/17 13:05

Sample Container: Amber Glass 500mL - unpreserved

**General Chemistry** 

Analyte Result Qualifier RL **MDL** Unit D Prepared **Analyzed** Dil Fac Organic Condensible Particulate 1.00 2.18 0.500 mg/sample 05/18/17 13:27

Matter

Client Sample ID: R-2524 R3 M5 PARTICULATE FILTER Lab Sample ID: 140-8122-11

Date Collected: 05/11/17 00:00

Date Received: 05/16/17 13:05 Sample Container: Petri/Filter

**General Chemistry** 

Analyte Result Qualifier RL MDL Unit D Prepared Analyzed Dil Fac Particulates, Total 35.7 0.500 0.500 mg/sample 05/20/17 10:04

Client Sample ID: R-2525 R3 M5 ACETONE PROBE RINSE Lab Sample ID: 140-8122-12

Date Collected: 05/11/17 00:00 Date Received: 05/16/17 13:05

Sample Container: Amber Glass 250ml - unpreserved

**General Chemistry** 

Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac Particulates, Total 20.6 0.500 0.500 mg/sample 05/20/17 10:04

Client Sample ID: R-2526 R3 M202 AQUEOUS FRACTION

Lab Sample ID: 140-8122-13 Date Collected: 05/11/17 00:00 Matrix: Air

Date Received: 05/16/17 13:05

Sample Container: Amber Glass 500mL - unpreserved

**General Chemistry** 

Analyte Result Qualifier RL MDL Unit D Prepared Analyzed Dil Fac Inorganic Condensible 49.2 1.00 0.500 mg/sample 05/18/17 13:19

**Particulate Matter** 

Matrix: Air

Matrix: Air

Client: URS Corporation

Project/Site: Suncoke - M5/M202

TestAmerica Job ID: 140-8122-1

Client Sample ID: R-2527 R3 M202 ACETONE/HEXANE

ORGANIC FRACTION

Date Collected: 05/11/17 00:00 Date Received: 05/16/17 13:05

Sample Container: Amber Glass 500mL - unpreserved

Lab Sample ID: 140-8122-14

Matrix: Air

**General Chemistry** 

Analyte

**Organic Condensible Particulate** Matter

Result Qualifier 1.89

RL 1.00

MDL Unit 0.500 mg/sample Prepared

D

D

Analyzed 05/18/17 13:27 Dil Fac

Client Sample ID: R-2597 QC M5 PARTICULATE FILTER PB

Date Collected: 05/07/17 00:00

Date Received: 05/16/17 13:05 Sample Container: Petri/Filter Lab Sample ID: 140-8122-16

Matrix: Air

**General Chemistry** 

Particulates, Total

Analyte

Result Qualifier ND

RL 0.500

RL

1.00

MDL Unit 0.500 mg/sample Prepared

Analyzed 05/20/17 10:04 Dil Fac

Client Sample ID: R-2599 QC ACETONE/HEXANE PB

Date Collected: 05/07/17 00:00

Date Received: 05/16/17 13:05

Sample Container: Amber Glass 500mL - unpreserved

Lab Sample ID: 140-8122-17

Matrix: Air

**General Chemistry** Analyte

Matter

RB

**Organic Condensible Particulate** 

Result Qualifier 1.56

MDL Unit

0.500 mg/sample

D Prepared

Analyzed 05/18/17 13:27

Lab Sample ID: 140-8122-18

Dil Fac

Matrix: Air

Client Sample ID: R-2600 QC M202 DI WATER PB

Date Collected: 05/07/17 00:00

Date Received: 05/16/17 13:05

Sample Container: Amber Glass 500mL - unpreserved

**General Chemistry** Analyte

Inorganic Condensible **Particulate Matter** 

Result Qualifier RL 1.00

**MDL** Unit 0.500 mg/sample Prepared

Analyzed 05/18/17 13:19 Dil Fac

Client Sample ID: R-2601 QC M5/202 PARTICULATE FILTER

3.46

Date Collected: 05/09/17 00:00

Date Received: 05/16/17 13:05 Sample Container: Petri/Filter Lab Sample ID: 140-8122-20

Matrix: Air

**General Chemistry** 

Analyte Particulates, Total Result Qualifier ND

RL 0.500

MDL Unit 0.500 mg/sample

D

Prepared

Analyzed 05/20/17 10:04 Dil Fac

Client: URS Corporation

Project/Site: Suncoke - M5/M202

Client Sample ID: R-2602 QC M202 ACETONE RB

Lab Sample ID: 140-8122-21

Lab Sample ID: 140-8122-22

TestAmerica Job ID: 140-8122-1

Matrix: Air

Matrix: Air

Matrix: Air

Matrix: Air

Date Collected: 05/11/17 00:00

Date Received: 05/16/17 13:05

Sample Container: Amber Glass 250ml - unpreserved

**General Chemistry** 

Analyte Result Qualifier RL MDL Unit D Prepared **Analyzed** Dil Fac **Organic Condensible Particulate** 1.00 1.27 0.500 mg/sample 05/18/17 13:27

Matter

Client Sample ID: R-2603 QC M202 HEXANE RB

Date Collected: 05/11/17 00:00

Date Received: 05/16/17 13:05

Sample Container: Amber Glass 250ml - unpreserved

**General Chemistry** 

Analyte Result Qualifier RL MDL Unit D Prepared Analyzed Dil Fac **Organic Condensible Particulate** 1.09 1.00 0.500 mg/sample 05/18/17 13:27

Matter

Client Sample ID: R-2604 QC M202 DI WATER RB Lab Sample ID: 140-8122-23

Date Collected: 05/11/17 00:00

Date Received: 05/16/17 13:05

Sample Container: Amber Glass 500mL - unpreserved

**General Chemistry** 

Analyte Result Qualifier RL MDL Unit Prepared Analyzed Dil Fac Inorganic Condensible 1.83 1.00 0.500 mg/sample 05/18/17 13:19

**Particulate Matter** 

Client Sample ID: R-3001 QC M202 FB AQUEOUS FRACTION Lab Sample ID: 140-8122-25

Date Collected: 05/09/17 00:00

Date Received: 05/16/17 13:05

Sample Container: Amber Glass 500mL - unpreserved

**General Chemistry** 

Analyte Result Qualifier RL MDL Unit D Prepared Analyzed Dil Fac 1.00 0.500 mg/sample Inorganic Condensible 2.80 05/18/17 13:19

**Particulate Matter** 

Client Sample ID: R-3002 QC M202 FB ACETONE/HEXANE Lab Sample ID: 140-8122-26

**FRACTION** 

Date Collected: 05/09/17 00:00 Matrix: Air

Date Received: 05/16/17 13:05

Sample Container: Amber Glass 500mL - unpreserved

**General Chemistry** 

Analyte Result Qualifier RL MDL Unit D Prepared Analyzed Dil Fac Organic Condensible Particulate 1.00 1.29 0.500 mg/sample 05/18/17 13:27

Matter

Client: URS Corporation

Project/Site: Suncoke - M5/M202

TestAmerica Job ID: 140-8122-1

Lab Sample ID: 140-8122-27

Matrix: Air

Client Sample ID: A-6253 MEDIA CHECK M5 Date Collected: 05/07/17 00:00

Date Received: 05/16/17 13:05

Sample Container: Petri/Filter

General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Particulates, Total	ND		0.500	0.500	mg/sample	_		05/20/17 10:04	1

## **Default Detection Limits**

Client: URS Corporation

Project/Site: Suncoke - M5/M202

TestAmerica Job ID: 140-8122-1

## **General Chemistry**

Analyte	RL	MDL	Units	Method
Inorganic Condensible Particulate Matter	1.00	0.500	mg/sample	202 InOrg CPM
Organic Condensible Particulate Matter	1.00	0.500	mg/sample	202 Org CPM
Particulates, Total	0.500	0.500	mg/sample	5

Client: URS Corporation

Project/Site: Suncoke - M5/M202

TestAmerica Job ID: 140-8122-1

Lab Sample ID: 140-8122-1

Client Sample ID: R-2434 R1 M5 PARTICULATE FILTER

Date Collected: 05/10/17 00:00

Matrix: Air

Matrix: Air

Date Received: 05/16/17 13:05

Batch Dil Initial Final **Batch** Batch Prepared

Prep Type Type Method Run Factor Amount Amount Number or Analyzed Analyst Lab Total/NA Analysis 5 11467 05/20/17 10:04 TSN TAL KNX

Instrument ID: FT\_Gross

Client Sample ID: R-2435 R1 M5 ACETONE PROBE RINSE

Lab Sample ID: 140-8122-2 Date Collected: 05/10/17 00:00 Matrix: Air

Date Received: 05/16/17 13:05

Batch Batch Dil Initial Final Batch Prepared

Method Run Type Prep Type **Factor** Amount **Amount** Number or Analyzed **Analyst** Lab Total/NA Analysis 11467 05/20/17 10:04 TSN TAL KNX

Instrument ID: FT\_Gross

Client Sample ID: R-2436 R1 M202 AQUEOUS FRACTION Lab Sample ID: 140-8122-3

Date Collected: 05/10/17 00:00

Date Received: 05/16/17 13:05

Batch Batch Dil Initial Final Batch Prepared

Method Prep Type Type Run **Factor Amount** Amount Number or Analyzed Analyst Lab

Total/NA 202 InOrg CPM 11400 05/18/17 13:19 TAL KNX Analysis TSN

Instrument ID: NOEQUIP

Client Sample ID: R-2437 R1 M202 ACETONE/HEXANE Lab Sample ID: 140-8122-4

ORGANIC FRACTION

Date Collected: 05/10/17 00:00 Matrix: Air

Date Received: 05/16/17 13:05

Batch Batch Dil Initial **Final** Batch Prepared Method Prep Type Type Run **Amount Amount** Number or Analyzed **Factor Analyst** Lab Total/NA Analysis 202 Org CPM 11401 05/18/17 13:27 TSN TAL KNX

Instrument ID: NOEQUIP

Client Sample ID: R-2479 R2 M5 PARTICULATE FILTER Lab Sample ID: 140-8122-6

Date Collected: 05/10/17 00:00 Matrix: Air

Date Received: 05/16/17 13:05

Batch Batch Dil Initial Final Batch Prepared Prep Type Type Method Run **Factor** Amount **Amount** Number or Analyzed Analyst Lab

Total/NA Analysis 11467 05/20/17 10:04 TSN TAL KNX

Instrument ID: FT\_Gross

Client Sample ID: R-2480 R2 M5 ACETONE PROBE RINSE Lab Sample ID: 140-8122-7

Date Collected: 05/10/17 00:00

Date Received: 05/16/17 13:05

**Batch** Batch Dil Initial **Final Batch** Prepared Prep Type Type Method Run Factor Amount Amount Number or Analyzed **Analyst** Lab Total/NA 5 Analysis 11467 05/20/17 10:04 TSN TAL KNX

TestAmerica Knoxville

Matrix: Air

Client: URS Corporation

Project/Site: Suncoke - M5/M202

Client Sample ID: R-2480 R2 M5 ACETONE PROBE RINSE Lab Sample ID: 140-8122-7

Date Collected: 05/10/17 00:00

TestAmerica Job ID: 140-8122-1

Matrix: Air

Matrix: Air

Matrix: Air

Matrix: Air

Date Received: 05/16/17 13:05

Batch Batch Dil Initial Final Batch Prepared

Prep Type Type Method Number Run **Factor** Amount Amount or Analyzed Analyst Lab 5 Total/NA 11467 TAL KNX Analysis 05/20/17 10:04 TSN

Instrument ID: FT\_Gross

Client Sample ID: R-2481 R2 M202 AQUEOUS FRACTION Lab Sample ID: 140-8122-8

Date Collected: 05/10/17 00:00

Date Received: 05/16/17 13:05

**Batch** Batch Dil Initial **Final** Batch Prepared

Method Prep Type Type Run Factor Amount Amount Number or Analyzed Analyst Lab

Total/NA Analysis 202 InOrg CPM 11400 05/18/17 13:19 TSN TAL KNX

Instrument ID: NOEQUIP

Client Sample ID: R-2482 R2 M202 ACETONE/HEXANE Lab Sample ID: 140-8122-9

ORGANIC FRACTION

Date Collected: 05/10/17 00:00 Matrix: Air

Date Received: 05/16/17 13:05

Dil Batch Batch Initial **Final** Batch Prepared Prep Type Type Method Run Factor Amount Number Amount or Analyzed

**Analyst** Lab

Total/NA 202 Ora CPM Analysis 11401 05/18/17 13:27 TSN TAL KNX

Instrument ID: NOEQUIP

Client Sample ID: R-2524 R3 M5 PARTICULATE FILTER Lab Sample ID: 140-8122-11

Date Collected: 05/11/17 00:00

Date Received: 05/16/17 13:05

**Batch** Batch Dil Initial Final Batch Prepared

Method Prep Type Type **Factor** Amount Amount Number or Analyzed Run **Analyst** Lab Total/NA Analysis 5 11467 05/20/17 10:04 TSN TAL KNX

Instrument ID: FT\_Gross

Client Sample ID: R-2525 R3 M5 ACETONE PROBE RINSE Lab Sample ID: 140-8122-12

Date Collected: 05/11/17 00:00

Date Received: 05/16/17 13:05

Batch Batch Dil Initial Final Batch Prepared

Prep Type Type Method Run Factor **Amount** Amount Number or Analyzed Analyst Lab Total/NA Analysis 11467 05/20/17 10:04 TAL KNX TSN

Instrument ID: FT\_Gross

Client Sample ID: R-2526 R3 M202 AQUEOUS FRACTION Lab Sample ID: 140-8122-13

Date Collected: 05/11/17 00:00 Matrix: Air

Date Received: 05/16/17 13:05

Dil Batch Batch Initial **Batch** Final Prepared

Method Prep Type Type Run **Factor** Amount **Amount** Number or Analyzed **Analyst** Lab Total/NA Analysis 202 InOrg CPM 11400 TAL KNX 05/18/17 13:19 TSN

TestAmerica Knoxville Page 15 of 69 05/30/2017

Client: URS Corporation

Project/Site: Suncoke - M5/M202

TestAmerica Job ID: 140-8122-1

Client Sample ID: R-2526 R3 M202 AQUEOUS FRACTION

Lab Sample ID: 140-8122-13

Lab Sample ID: 140-8122-14

Lab Sample ID: 140-8122-17

Date Collected: 05/11/17 00:00

Matrix: Air

Date Received: 05/16/17 13:05

Batch Batch Dil Initial Final Batch Prepared

Prep Type Type Method Run **Factor Amount Amount** Number or Analyzed Analyst Lab Total/NA 202 InOrg CPM 11400 TAL KNX Analysis 05/18/17 13:19 TSN

Instrument ID: NOEQUIP

Client Sample ID: R-2527 R3 M202 ACETONE/HEXANE

ORGANIC FRACTION

Date Collected: 05/11/17 00:00 Matrix: Air

Date Received: 05/16/17 13:05

Dil Batch Batch Initial Final Batch Prepared Prep Type Type Method Run **Factor** Amount Amount Number

or Analyzed Analyst Lab Total/NA Analysis 202 Org CPM 11401 TAL KNX 05/18/17 13:27 TSN

Instrument ID: NOEQUIP

Client Sample ID: R-2597 QC M5 PARTICULATE FILTER PB Lab Sample ID: 140-8122-16

Date Collected: 05/07/17 00:00 Matrix: Air

Date Received: 05/16/17 13:05

Dil Batch Batch Initial Final **Batch** Prepared

Prep Type Type Method Amount Run Factor Amount Number or Analyzed Analyst Lab

Total/NA 5 Analysis 11467 05/20/17 10:04 TSN TAL KNX

Instrument ID: FT\_Gross

Client Sample ID: R-2599 QC ACETONE/HEXANE PB

Date Collected: 05/07/17 00:00 Matrix: Air

Date Received: 05/16/17 13:05

Batch Batch Dil Initial Final Batch Prepared Prep Type Type Method Run Factor **Amount** Amount Number or Analyzed **Analyst** Lab

Total/NA Analysis 202 Org CPM 11401 05/18/17 13:27 TSN TAL KNX

Instrument ID: NOEQUIP

Client Sample ID: R-2600 QC M202 DI WATER PB Lab Sample ID: 140-8122-18

Date Collected: 05/07/17 00:00 Matrix: Air

Date Received: 05/16/17 13:05

Batch Batch Dil Initial Final Batch Prepared Prep Type Type Method **Factor Amount Amount** Number Run or Analyzed **Analyst** Lab

Total/NA Analysis 11400 TAL KNX

202 InOrg CPM 05/18/17 13:19 TSN Instrument ID: NOEQUIP

Client: URS Corporation

Project/Site: Suncoke - M5/M202

TestAmerica Job ID: 140-8122-1

Client Sample ID: R-2601 QC M5/202 PARTICULATE FILTER

Lab Sample ID: 140-8122-20

RB

Date Collected: 05/09/17 00:00

Matrix: Air

Date Received: 05/16/17 13:05

Batch Batch Dil Initial Final Batch Prepared Prep Type Type Method Run **Amount** Amount Number **Factor** or Analyzed Analyst Lab Total/NA Analysis 11467 05/20/17 10:04 TSN TAL KNX

Instrument ID: FT\_Gross

Client Sample ID: R-2602 QC M202 ACETONE RB

Lab Sample ID: 140-8122-21

Matrix: Air

Matrix: Air

Date Collected: 05/11/17 00:00 Date Received: 05/16/17 13:05

Batch Batch Dil Initial Final Batch Prepared

or Analyzed Prep Type Type Method Run **Factor** Amount Amount Number **Analyst** Lab Total/NA Analysis 202 Org CPM 11401 05/18/17 13:27 TSN TAL KNX

Instrument ID: NOEQUIP

Client Sample ID: R-2603 QC M202 HEXANE RB Lab Sample ID: 140-8122-22

Date Collected: 05/11/17 00:00 Date Received: 05/16/17 13:05

Dil **Batch Batch** Initial Final Batch Prepared Prep Type Type Method Run **Factor** Amount Amount Number or Analyzed Analyst Lab Total/NA 202 Org CPM TAL KNX Analysis 11401 05/18/17 13:27 TSN

Instrument ID: NOEQUIP

Client Sample ID: R-2604 QC M202 DI WATER RB Lab Sample ID: 140-8122-23

Date Collected: 05/11/17 00:00 Matrix: Air

Date Received: 05/16/17 13:05

Batch Batch Dil Initial Final Batch Prepared Prep Type Type Method **Factor** Amount Amount Number or Analyzed Run Analyst Lab Total/NA Analysis 202 InOrg CPM 11400 05/18/17 13:19 TSN TAL KNX

Instrument ID: NOEQUIP

Client Sample ID: R-3001 QC M202 FB AQUEOUS FRACTION Lab Sample ID: 140-8122-25

Date Collected: 05/09/17 00:00 Matrix: Air

Date Received: 05/16/17 13:05

Batch Batch Dil Initial Final Batch Prepared

Prep Type Type Method Run Factor Amount Amount Number or Analyzed Analyst Lab Total/NA Analysis 202 InOrg CPM 11400 05/18/17 13:19 TSN TAL KNX

Instrument ID: NOEQUIP

Client: URS Corporation

Project/Site: Suncoke - M5/M202

TestAmerica Job ID: 140-8122-1

Client Sample ID: R-3002 QC M202 FB ACETONE/HEXANE Lab Sample ID: 140-8122-26

**FRACTION** 

Date Collected: 05/09/17 00:00

Date Received: 05/16/17 13:05

Matrix: Air

Batch Batch Dil Initial Final Batch Prepared Prep Type Type Method Run Factor **Amount** Amount Number or Analyzed Analyst Lab Total/NA Analysis 202 Org CPM 11401 05/18/17 13:27 TSN TAL KNX Instrument ID: NOEQUIP

Client Sample ID: A-6253 MEDIA CHECK M5

Date Collected: 05/07/17 00:00

Lab Sample ID: 140-8122-27

Matrix: Air

Date Received: 05/16/17 13:05

Batch Batch Dil Initial Final Batch **Prepared** Prep Type Туре Method Run Factor Amount **Amount** Number or Analyzed Analyst Lab Total/NA Analysis 11467 05/20/17 10:04 TSN TAL KNX Instrument ID: FT\_Gross

Laboratory References:

TAL KNX = TestAmerica Knoxville, 5815 Middlebrook Pike, Knoxville, TN 37921, TEL (865)291-3000

## **Accreditation/Certification Summary**

Client: URS Corporation

Project/Site: Suncoke - M5/M202

TestAmerica Job ID: 140-8122-1

## Laboratory: TestAmerica Knoxville

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	<b>Expiration Date</b>
	AFCEE		N/A	
Arkansas DEQ	State Program	6	88-0688	06-16-17
California	State Program	9	2423	06-30-18
Colorado	State Program	8	TN00009	02-28-18
Connecticut	State Program	1	PH-0223	09-30-17
Florida	NELAP	4	E87177	06-30-17
Georgia	State Program	4	906	04-13-20
Hawaii	State Program	9	N/A	04-13-18
Kansas	NELAP	7	E-10349	10-31-17
Kentucky (DW)	State Program	4	90101	12-31-17
A-B	DoD ELAP		L2311	02-13-19
_ouisiana	NELAP	6	83979	06-30-17
₋ouisiana (DW)	NELAP	6	LA160005	12-31-17
Maryland	State Program	3	277	03-31-18
⁄lichigan	State Program	5	9933	04-13-17 *
Nevada	State Program	9	TN00009	07-31-17
New Jersey	NELAP	2	TN001	06-30-17
New York	NELAP	2	10781	03-31-18
North Carolina (DW)	State Program	4	21705	07-31-17
North Carolina (WW/SW)	State Program	4	64	12-31-17
Dhio VAP	State Program	5	CL0059	11-22-18
Oklahoma	State Program	6	9415	08-31-17
Pennsylvania	NELAP	3	68-00576	12-31-17
Tennessee	State Program	4	2014	04-13-20
Гехаs	NELAP	6	T104704380-16-9	08-31-17
JSDA	Federal		P330-13-00262	08-20-19
Jtah	NELAP	8	TN00009	07-31-17
/irginia	NELAP	3	460176	09-14-17
Vashington	State Program	10	C593	01-19-18
Vest Virginia (DW)	State Program	3	9955C	12-31-17
Vest Virginia DEP	State Program	3	345	04-30-18
Visconsin	State Program	5	998044300	08-31-17

<sup>\*</sup> Accreditation/Certification renewal pending - accreditation/certification considered valid.



## **ANALYTICAL REPORT**

Job Number: 140-8115-1

Job Description: Suncoke - M5/29

For:

URS Corporation 105 Mitchell Road, Suite 200 Oak Ridge, TN 37830

Attention: John Carson

Approved for releas Courtney M Adkins Project Manager I 7/6/2017 2:29 PM

Courtney M Adkins, Project Manager I 5815 Middlebrook Pike, Knoxville, TN, 37921 (865)291-3000 courtney.adkins@testamericainc.com 07/06/2017

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## **Definitions/Glossary**

Client: URS Corporation Project/Site: Suncoke - M5/29

TestAmerica Job ID: 140-8115-1

## Qualifiers

ľ	V	е	ta	Is

Qualifier	Qualifier Description
В	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value,
W	PS: Post-digestion spike was outside control limits
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
V	Serial Dilution exceeds the control limits

## Glossary

TEF

TEQ

Toxicity Equivalent Factor (Dioxin)

Toxicity Equivalent Quotient (Dioxin)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
•	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R =	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points

## **Method Summary**

Client: URS Corporation Project/Site: Suncoke - M5/29

TestAmerica Job ID: 140-8115-1

Method	Method Description	Protocol	Laboratory
29/6020A	Metals (ICPMS), Stationary Source	EPA	TAL PIT
29/7470A	Mercury (CVAA), Stationary Source	EPA	TAL KNX
5	Particulates	EPA	TAL KNX

#### **Protocol References:**

EPA = US Environmental Protection Agency

#### **Laboratory References:**

TAL KNX = TestAmerica Knoxville, 5815 Middlebrook Pike, Knoxville, TN 37921, TEL (865)291-3000 TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Client: URS Corporation Project/Site: Suncoke - M5/29

	Client Sample ID	Matrix	Collected	Received
Lab Sample ID 140-8115-1	R-2421 F2 R1 M5 FILTER	Air		05/16/17 13:05
140-8115-2	R-2422 F2 R1 M5 ACETONE	Air		05/16/17 13:05
140-8115-3	R-2421,2422,2423 F2 R1 M29 FH COMP	Air		05/16/17 13:05
140-8115-4	R-2424 F2 R1 M29 BH IMP	Air		05/16/17 13:05
140-8115-5	R-2425 F2 R1 M29 EMPTY IMP	Air		05/16/17 13:05
140-8115-6	R-2426 F2 R1 M29 KMNO4/H2SO4 IMP	Air		05/16/17 13:05
40-8115-7	R-2427 F2 R1 M29 HCL RINSE	Air		05/16/17 13:05
40-8115-8	R-2466 F2 R2 M5 FILTER	Air		05/16/17 13:05
140-8115-9	R-2467 F2 R2 M5 ACETONE	Air		05/16/17 13:05
40-8115-9  40-8115-10	R-2466,2467,2468 F2 R2 M29 FH COMP	Air		05/16/17 13:05
40-8115-10  40-8115-11	R-2469 F2 R2 M29 BH IMP	Air		05/16/17 13:05
40-8115-12	R-2470 F2 R2 M29 EMPTY IMP	Air		05/16/17 13:05
40-8115-13	R-2471 F2 R2 M29 KMNO4/H2SO4 IMP	Air		
				05/16/17 13:05
40-8115-14	R-2472 F2 R2 M29 HCL RINSE	Air		05/16/17 13:05
40-8115-15	R-2511 F2 R3 M5 FILTER	Air		05/16/17 13:05
40-8115-16	R-2512 F2 R3 M5 ACETONE	Air		05/16/17 13:05
40-8115-17	R-2511,2512,2513 F2 R3 M29 FH COMP	Air		05/16/17 13:05
40-8115-18	R-2514 F2 R3 M29 BH IMP	Air		05/16/17 13:05
40-8115-19	R-2515 F2 R3 M29 EMPTY IMP	Air		05/16/17 13:05
40-8115-20	R-2516 F2 R3 M29 KMNO4/H2SO4 IMP	All I		05/16/17 13:05
40-8115-21	R-2517 F2 R3 M29 HCL RINSE IMP			05/16/17 13:05
40-8115-26	R-2535 F2 R4 M5 FILTER	AIR		05/16/17 13:05
40-8115-27	R-2536 F2 R4 M5 ACETONE	Air Air		05/16/17 13:05
40-8115-28	R-2535,2536,2537 F2 R4 M29 FH COMP	Air		05/16/17 13:05
40-8115-29	R-2538 F2 R4 M29 BH IMP	V Air	62	05/16/17 13:05
40-8115-30	R-2539 F2 R4 M29 EMPTY IMP	\ Air X		05/16/17 13:05
40-8115-31	R-2540 F2 R4 M29 KMNO4/H2SO4 IMP	Air /	7 05/09/17 00:00	05/16/17 13:05
40-8115-32	R-2541 F2 R4 M29 HCL RINSE \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	/ Air	05/09/17 00:00	05/16/17 13:05
40-8115-33	R-2542 F2 R5 M5 FILTER \ \ \ \ \ \	Air C	05/10/17 00:00	05/16/17 13:05
40-8115-34	R-2543 F2 R5 M5 ACETONE	Air		05/16/17 13:05
40-8115-35	R-2542,2543,2544 F2 R5 M29 FH COMP	Air /	05/10/17 00:00	05/16/17 13:05
40-8115-36	R-2545 F2 R5 M29 BH IMP	/\ Air\	05/10/17 00:00	05/16/17 13:05
40-8115-37	R-2546 F2 R5 M29 EMPTY IMP	/ \ Air //	05/10/17 00:00	05/16/17 13:05
40-8115-38	R-2547 F2 R5 M29 KMNO4/H2SO4 IMP	\ Air //	05/10/17 00:00	05/16/17 13:05
40-8115-39	R-2548 F2 R5 M29 HCL RINSE	Air	05/10/17 00:00	05/16/17 13:05
40-8115-40	R-2549 F2 R6 M5 FILTER	Air	05/11/17 00:00	05/16/17 13:05
40-8115-41	R-2550 F2 R6 M5 ACETONE	Air	05/11/17 00:00	05/16/17 13:05
40-8115-42	R-2549,2550,2551 F2 R6 M29 FH COMP	Air	05/11/17 00:00	05/16/17 13:05
40-8115-43	R-2552 F2 R6 M29 BH IMP	Air	05/11/17 00:00	05/16/17 13:05
40-8115-44	R-2553 F2 R6 M29 EMPTY IMP	Air	05/11/17 00:00	05/16/17 13:05
40-8115-45	R-2554 F2 R6 M29 KMNO4 IMP	Air	05/11/17 00:00	05/16/17 13:05
40-8115-46	R-2555 F2 R6 M29 HCL RINSE	Air	05/11/17 00:00	05/16/17 13:05
40-8115-49	R-2617 F2 QC M5 FILTER RB #2	Air		05/16/17 13:05
40-8115-50	R-2618 F2 QC M5 ACETONE RB #2	Air		05/16/17 13:05
40-8115-51	R-2617,2618,2619 F2 QC M29 FH COMP RB #2	Air		05/16/17 13:05
40-8115-52	R-2620 F2 QC M29 BH IMP RB #2	Air		05/16/17 13:05
40-8115-53	R-2622 F2 QC M29 KMNO4/H2SO4 IMP RB #2	Air		05/16/17 13:05
40-8115-53 40-8115-54	R-2623 F2 QC M29 HCL RINSE RB #2	Air		05/16/17 13:05
	N-2023 I Z WO IVIZƏ HOL KINSE KD #Z	All .	03/11/1/ 00:00	- 00/10/1/ 10.00

TestAmerica Job ID: 140-8115-1

# Job Narrative 140-8115-1

#### Sample Receipt

The samples were received on May 16, 2017 at 1:05 PM in good condition and properly preserved. The temperature of the cooler at receipt was 22.0° C.

#### **Quality Control and Data Interpretation**

Unless otherwise noted, all holding times, and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

#### Metals

Multi-Metals Train Preparation and Analysis

These stack gas samples were prepared and analyzed using TestAmerica Knoxville standard operating procedure KNOX-MT-0006 which is based on EPA SW-846 Method 0060, "Determination of Metals in Stack Emissions" and Method 29, "Determination of Metals Emissions from Stationary Sources". SW-846 7470A as incorporated in TestAmerica Knoxville standard operating procedure KNOX-MT-0009 was used to perform the final instrument analysis for mercury. A portion of the sample digestates were sent to TestAmerica Pittsburgh for ICPMS analysis by SW-846 method 6020A.

Acid digestion was performed on the front half particulate filter and the acetone and nitric acid probe rinse fractions separately using HNO3 and HF. After digestion, the HF was sequestered using H3BO3 followed by another heating cycle. These digestates were combined, adjusted to final volume and analyzed by ICPMS. A portion of the ICPMS digestate was prepared for CVAA analysis in order to determine the particle-bound mercury. Results were calculated using the following equations:

ICPMS Analyte, μg/sample = (Raw Sample Concentration, μg/L) x (Bench DF) x (Final Volume ICPMS Digestate, L)

Hg, μg/sample = (Raw Sample Concentration, μg/L) x (Bench DF) x (Final Volume ICPMS Digestate, L) x (Final Volume Hg Digestate, mL / Volume ICPMS Digestate Used, mL)

The 5%HNO3/10%H2O2 impinger samples were reduced in volume to 100 mL. A 20 milliliter portion of the concentrated sample was removed and processed for mercury. The remaining 80 mL of concentrated sample was digested using HNO3 and H2O2, adjusted to a final volume of 80 mL, and analyzed by ICPMS. Results were calculated using the following equations:

ICPMS Analyte, μg/sample = (Raw Sample Concentration, μg/L) x (Bench DF) x (Final Volume Concentrated Sample, L) x (Final Volume ICPMS Digestate, mL / Volume Concentrated Sample Digested, mL)

Hg,  $\mu$ g/sample = (Raw Sample Concentration,  $\mu$ g/L) x (Bench DF) x (Final Volume Concentrated Sample, L) x (Final Volume Hg Digestate, mL / Volume Concentrated Sample Digested, mL)

For the 0.1N HNO3 rinse samples (empty impingers), a 2.5 milliliter portion of the sample as received was removed and processed for mercury.

The 4% KMnO4/10%H2SO4 impinger samples were filtered to remove MnO2, followed by removal of a 25 mL portion of filtrate for mercury processing. The filtered MnO2 residue was digested in HCl, combined with the HCl rinse sample and analyzed for mercury.

Results for the 0.1N HNO3 rinse samples and the KMnO4 filtrate were calculated using the following equation:

Hg,  $\mu$ g/sample = (Raw Sample Concentration,  $\mu$ g/L) x (Bench DF) x (Total Sample Volume, L) x (Final Volume Hg Digestate, mL / Volume Sample Digested, mL)

Results for the combined MnO2 residue HCl digestates and HCl rinse samples were calculated as follows:

Hg, μg/sample = (Raw Sample Concentration, μg/L) x (Bench DF) x (Total Sample Volume, L + MnO2 HCl Volume, L) x (Final Volume Hg Digestate, mL / Volume Sample Digested, mL)

Note: The total sample volume for the 5%HNO3/10%H2O2 impinger samples is the final volume of the concentrated sample. The total sample volume for the combined MnO2 residue HCl digestates and HCl rinse samples is equal to the total sample volume plus the MnO2 HCl volume.

Method 29/6020A: The serial dilution performed for the following sample associated with batch 211848 was outside of the control limits for chromium and selenium.: R-2424 F2 R1 M29 BH IMP (140-8115-4)

Method 29/6020A: The post digestion duplicate spike % recovery for beryllium associated with batch 212181 was outside of the control

limits.

#### **General Chemistry**

Total Particulates: The measurement of the mass of particulate matter trapped by the particulate filter and probe rinse derived from an M-5 sampling train was performed using SOP number KNOX-WC-0006 (based on EPA Methods 0050 and 5). Microfiber filters and 150 mL beakers are carefully inspected and tare weighed to constant weight. After sample collection, the filters are dried, and then carefully weighed to constant weight to determine the mass of particulate matter trapped on the filters. The acetone probe rinse solution is evaporated to dryness, and then weighed to constant weight to determine the total particulate mass collected in the rinse. The total particulate mass collected by an M-5 train is the sum of the particulate filter and the acetone probe rinse residue weights.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Client: URS Corporation Project/Site: Suncoke - M5/29

TestAmerica Job ID: 140-8115-1

### Metals

Pre	Prep	Batch:	11528
1 10	IICP	Dateii.	11020

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-8115-6	R-2426 F2 R1 M29 KMNO4/H2SO4 IMP	Total/NA	Air	Air Train Vol.	
140-8115-13	R-2471 F2 R2 M29 KMNO4/H2SO4 IMP	Total/NA	Air	Air Train Vol.	
140-8115-20	R-2516 F2 R3 M29 KMNO4/H2SO4 IMP	Total/NA	Air	Air Train Vol.	
140-8115-31	R-2540 F2 R4 M29 KMNO4/H2SO4 IMP	Total/NA	Air	Air Train Vol.	
140-8115-38	R-2547 F2 R5 M29 KMNO4/H2SO4 IMP	Total/NA	Air	Air Train Vol.	
140-8115-45	R-2554 F2 R6 M29 KMNO4 IMP	Total/NA	Air	Air Train Vol.	
140-8115-53	R-2622 F2 QC M29 KMNO4/H2SO4 IMP RB #2	Total/NA	Air	Air Train Vol.	
MB 140-11528/10-B	Method Blank	Total/NA	Air	Air Train Vol.	
LCS 140-11528/11-B	Lab Control Sample	Total/NA	Air	Air Train Vol.	
140-8115-6 MS	R-2426 F2 R1 M29 KMNO4/H2SO4 IMP	Total/NA	Air	Air Train Vol.	
140-8115-6 MSD	R-2426 F2 R1 M29 KMNO4/H2SO4 IMP	Total/NA	Air	Air Train Vol.	

## Prep Batch: 11529

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-8115-6	R-2426 F2 R1 M29 KMNO4/H2SO4 IMP	Total/NA	Air	AT Prep	11528
				(KMnO4)	
140-8115-13	R-2471 F2 R2 M29 KMNO4/H2SO4 IMP	Total/NA	Air	AT Prep	11528
				(KMnO4)	
140-8115-20	R-2516 F2 R3 M29 KMNO4/H2SO4 IMP	Total/NA	Air	AT Prep	11528
				(KMnO4)	
140-8115-31	R-2540 F2 R4 M29 KMNO4/H2SO4 IMP	Total/NA	Air	AT Prep	11528
				(KMnO4)	
140-8115-38	R-2547 F2 R5 M29 KMNO4/H2SO4 IMP	Total/NA	Air	AT Prep	11528
				(KMnO4)	
140-8115-45	R-2554 F2 R6 M29 KMNO4 IMP	Total/NA	Air	AT Prep	11528
				(KMnO4)	
140-8115-53	R-2622 F2 QC M29 KMNO4/H2SO4 IMP RB #2	Total/NA	Air	AT Prep	11528
				(KMnO4)	
MB 140-11528/10-B	Method Blank	Total/NA	Air	AT Prep	11528
				(KMnO4)	
LCS 140-11528/11-B	Lab Control Sample	Total/NA	Air	AT Prep	11528
				(KMnO4)	
140-8115-6 MS	R-2426 F2 R1 M29 KMNO4/H2SO4 IMP	Total/NA	Air	AT Prep	11528
				(KMnO4)	
140-8115-6 MSD	R-2426 F2 R1 M29 KMNO4/H2SO4 IMP	Total/NA	Air	AT Prep	11528
				(KMnO4)	

### Pre Prep Batch: 11538

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-8115-5	R-2425 F2 R1 M29 EMPTY IMP	Total/NA	Air	Air Train Vol.	
140-8115-12	R-2470 F2 R2 M29 EMPTY IMP	Total/NA	Air	Air Train Vol.	
140-8115-19	R-2515 F2 R3 M29 EMPTY IMP	Total/NA	Air	Air Train Vol.	
140-8115-30	R-2539 F2 R4 M29 EMPTY IMP	Total/NA	Air	Air Train Vol.	
140-8115-37	R-2546 F2 R5 M29 EMPTY IMP	Total/NA	Air	Air Train Vol.	
140-8115-44	R-2553 F2 R6 M29 EMPTY IMP	Total/NA	Air	Air Train Vol.	
MB 140-11538/9-B	Method Blank	Total/NA	Air	Air Train Vol.	
LCS 140-11538/10-B	Lab Control Sample	Total/NA	Air	Air Train Vol.	
140-8115-5 MS	R-2425 F2 R1 M29 EMPTY IMP	Total/NA	Air	Air Train Vol.	
140-8115-5 MSD	R-2425 F2 R1 M29 EMPTY IMP	Total/NA	Air	Air Train Vol.	

#### Prep Batch: 11539

7	Trep Batem 11000					
	Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
	140-8115-5	R-2425 F2 R1 M29 EMPTY IMP	Total/NA	Air	AT Prep (Empty)	11538

Client: URS Corporation TestAmerica Job ID: 140-8115-1 Project/Site: Suncoke - M5/29

## **Metals (Continued)**

## Prep Batch: 11539 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-8115-12	R-2470 F2 R2 M29 EMPTY IMP	Total/NA	Air	AT Prep (Empty)	11538
140-8115-19	R-2515 F2 R3 M29 EMPTY IMP	Total/NA	Air	AT Prep (Empty)	11538
140-8115-30	R-2539 F2 R4 M29 EMPTY IMP	Total/NA	Air	AT Prep (Empty)	11538
140-8115-37	R-2546 F2 R5 M29 EMPTY IMP	Total/NA	Air	AT Prep (Empty)	11538
140-8115-44	R-2553 F2 R6 M29 EMPTY IMP	Total/NA	Air	AT Prep (Empty)	11538
MB 140-11538/9-B	Method Blank	Total/NA	Air	AT Prep (Empty)	11538
LCS 140-11538/10-B	Lab Control Sample	Total/NA	Air	AT Prep (Empty)	11538
140-8115-5 MS	R-2425 F2 R1 M29 EMPTY IMP	Total/NA	Air	AT Prep (Empty)	11538
140-8115-5 MSD	R-2425 F2 R1 M29 EMPTY IMP	Total/NA	Air	AT Prep (Empty)	11538

### Pre Prep Batch: 11540

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-8115-7	R-2427 F2 R1 M29 HCL RINSE	Total/NA	Air	Air Train Vol.	-
140-8115-14	R-2472 F2 R2 M29 HCL RINSE	Total/NA	Air	Air Train Vol.	
140-8115-21	R-2517 F2 R3 M29 HCL RINSE IMP	Total/NA	Air	Air Train Vol.	
140-8115-32	R-2541 F2 R4 M29 HCL RINSE	Total/NA	Air	Air Train Vol.	
140-8115-39	R-2548 F2 R5 M29 HCL RINSE	Total/NA	Air	Air Train Vol.	
140-8115-46	R-2555 F2 R6 M29 HCL RINSE	Total/NA	Air	Air Train Vol.	
140-8115-54	R-2623 F2 QC M29 HCL RINSE RB #2	Total/NA	Air	Air Train Vol.	
MB 140-11540/10-B	Method Blank	Total/NA	Air	Air Train Vol.	
LCS 140-11540/11-B	Lab Control Sample	Total/NA	Air	Air Train Vol.	
140-8115-7 MS	R-2427 F2 R1 M29 HCL RINSE	Total/NA	Air	Air Train Vol.	
140-8115-7 MSD	R-2427 F2 R1 M29 HCL RINSE	Total/NA	Air	Air Train Vol.	

#### Prep Batch: 11541

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-8115-7	R-2427 F2 R1 M29 HCL RINSE	Total/NA	Air	AT Prep (HCI)	11540
140-8115-14	R-2472 F2 R2 M29 HCL RINSE	Total/NA	Air	AT Prep (HCI)	11540
140-8115-21	R-2517 F2 R3 M29 HCL RINSE IMP	Total/NA	Air	AT Prep (HCI)	11540
140-8115-32	R-2541 F2 R4 M29 HCL RINSE	Total/NA	Air	AT Prep (HCI)	11540
140-8115-39	R-2548 F2 R5 M29 HCL RINSE	Total/NA	Air	AT Prep (HCI)	11540
140-8115-46	R-2555 F2 R6 M29 HCL RINSE	Total/NA	Air	AT Prep (HCI)	11540
140-8115-54	R-2623 F2 QC M29 HCL RINSE RB #2	Total/NA	Air	AT Prep (HCI)	11540
MB 140-11540/10-B	Method Blank	Total/NA	Air	AT Prep (HCI)	11540
LCS 140-11540/11-B	Lab Control Sample	Total/NA	Air	AT Prep (HCI)	11540
140-8115-7 MS	R-2427 F2 R1 M29 HCL RINSE	Total/NA	Air	AT Prep (HCI)	11540
140-8115-7 MSD	R-2427 F2 R1 M29 HCL RINSE	Total/NA	Air	AT Prep (HCI)	11540

### Pre Prep Batch: 11542

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-8115-4	R-2424 F2 R1 M29 BH IMP	Total/NA	Air	Air Train Vol.	
140-8115-11	R-2469 F2 R2 M29 BH IMP	Total/NA	Air	Air Train Vol.	
140-8115-18	R-2514 F2 R3 M29 BH IMP	Total/NA	Air	Air Train Vol.	
140-8115-29	R-2538 F2 R4 M29 BH IMP	Total/NA	Air	Air Train Vol.	
140-8115-36	R-2545 F2 R5 M29 BH IMP	Total/NA	Air	Air Train Vol.	
140-8115-43	R-2552 F2 R6 M29 BH IMP	Total/NA	Air	Air Train Vol.	
140-8115-52	R-2620 F2 QC M29 BH IMP RB #2	Total/NA	Air	Air Train Vol.	
MB 140-11542/10-B	Method Blank	Total/NA	Air	Air Train Vol.	
LCS 140-11542/11-B	Lab Control Sample	Total/NA	Air	Air Train Vol.	
140-8115-4 MS	R-2424 F2 R1 M29 BH IMP	Total/NA	Air	Air Train Vol.	
140-8115-4 MSD	R-2424 F2 R1 M29 BH IMP	Total/NA	Air	Air Train Vol.	

Client: URS Corporation TestAmerica Job ID: 140-8115-1 Project/Site: Suncoke - M5/29

Prep Batch: 11543

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-8115-4	R-2424 F2 R1 M29 BH IMP	Total/NA	Air	AT Prep (BH)	11542
140-8115-11	R-2469 F2 R2 M29 BH IMP	Total/NA	Air	AT Prep (BH)	11542
140-8115-18	R-2514 F2 R3 M29 BH IMP	Total/NA	Air	AT Prep (BH)	11542
140-8115-29	R-2538 F2 R4 M29 BH IMP	Total/NA	Air	AT Prep (BH)	11542
140-8115-36	R-2545 F2 R5 M29 BH IMP	Total/NA	Air	AT Prep (BH)	11542
140-8115-43	R-2552 F2 R6 M29 BH IMP	Total/NA	Air	AT Prep (BH)	11542
140-8115-52	R-2620 F2 QC M29 BH IMP RB #2	Total/NA	Air	AT Prep (BH)	11542
MB 140-11542/10-B	Method Blank	Total/NA	Air	AT Prep (BH)	11542
LCS 140-11542/11-B	Lab Control Sample	Total/NA	Air	AT Prep (BH)	11542
140-8115-4 MS	R-2424 F2 R1 M29 BH IMP	Total/NA	Air	AT Prep (BH)	11542
140-8115-4 MSD	R-2424 F2 R1 M29 BH IMP	Total/NA	Air	AT Prep (BH)	11542

## Analysis Batch: 11616

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batc
140-8115-4	R-2424 F2 R1 M29 BH IMP	Total/NA	Air	29/7470A	1154
140-8115-5	R-2425 F2 R1 M29 EMPTY IMP	Total/NA	Air	29/7470A	1153
140-8115-6	R-2426 F2 R1 M29 KMNO4/H2SO4 IMP	Total/NA	Air	29/7470A	1152
140-8115-7	R-2427 F2 R1 M29 HCL RINSE	Total/NA	Air	29/7470A	1154
140-8115-11	R-2469 F2 R2 M29 BH IMP	Total/NA	Air	29/7470A	1154
140-8115-12	R-2470 F2 R2 M29 EMPTY IMP	Total/NA	Air	29/7470A	1153
140-8115-13	R-2471 F2 R2 M29 KMNO4/H2SO4 IMP	Total/NA	Air	29/7470A	1152
140-8115-14	R-2472 F2 R2 M29 HCL RINSE	Total/NA	Air	29/7470A	1154
140-8115-18	R-2514 F2 R3 M29 BH IMP	Total/NA	Air	29/7470A	1154
140-8115-19	R-2515 F2 R3 M29 EMPTY IMP	Total/NA	Air	29/7470A	1153
140-8115-20	R-2516 F2 R3 M29 KMNO4/H2SO4 IMP	Total/NA	Air	29/7470A	1152
140-8115-21	R-2517 F2 R3 M29 HCL RINSE IMP	Total/NA	Air	29/7470A	1154
140-8115-29	R-2538 F2 R4 M29 BH IMP	Total/NA	Air	29/7470A	1154
140-8115-30	R-2539 F2 R4 M29 EMPTY IMP	Total/NA	Air	29/7470A	1153
140-8115-31	R-2540 F2 R4 M29 KMNO4/H2SO4 IMP	Total/NA	Air	29/7470A	1152
140-8115-32	R-2541 F2 R4 M29 HCL RINSE	Total/NA	Air	29/7470A	1154
40-8115-36	R-2545 F2 R5 M29 BH IMP	Total/NA	Air	29/7470A	1154
140-8115-37	R-2546 F2 R5 M29 EMPTY IMP	Total/NA	Air	29/7470A	1153
140-8115-38	R-2547 F2 R5 M29 KMNO4/H2SO4 IMP	Total/NA	Air	29/7470A	1152
140-8115-39	R-2548 F2 R5 M29 HCL RINSE	Total/NA	Air	29/7470A	1154
40-8115-43	R-2552 F2 R6 M29 BH IMP	Total/NA	Air	29/7470A	1154
140-8115-44	R-2553 F2 R6 M29 EMPTY IMP	Total/NA	Air	29/7470A	11539
140-8115-45	R-2554 F2 R6 M29 KMNO4 IMP	Total/NA	Air	29/7470A	1152
40-8115-46	R-2555 F2 R6 M29 HCL RINSE	Total/NA	Air	29/7470A	1154
140-8115-52	R-2620 F2 QC M29 BH IMP RB #2	Total/NA	Air	29/7470A	1154
40-8115-53	R-2622 F2 QC M29 KMNO4/H2SO4 IMP RB #2	Total/NA	Air	29/7470A	1152
40-8115-54	R-2623 F2 QC M29 HCL RINSE RB #2	Total/NA	Air	29/7470A	1154
MB 140-11528/10-B	Method Blank	Total/NA	Air	29/7470A	1152
//B 140-11538/9-B	Method Blank	Total/NA	Air	29/7470A	1153
/IB 140-11540/10-B	Method Blank	Total/NA	Air	29/7470A	1154
MB 140-11542/10-B	Method Blank	Total/NA	Air	29/7470A	1154
-CS 140-11528/11-B	Lab Control Sample	Total/NA	Air	29/7470A	11529
_CS 140-11538/10-В	Lab Control Sample	Total/NA	Air	29/7470A	1153
.CS 140-11540/11-B	Lab Control Sample	Total/NA	Air	29/7470A	1154
.CS 140-11542/11-B	Lab Control Sample	Total/NA	Air	29/7470A	1154
40-8115-4 MS	R-2424 F2 R1 M29 BH IMP	Total/NA	Air	29/7470A	1154
40-8115-4 MSD	R-2424 F2 R1 M29 BH IMP	Total/NA	Air	29/7470A	1154
140-8115-5 MS	R-2425 F2 R1 M29 EMPTY IMP	Total/NA	Air	29/7470A	1153
140-8115-5 MSD	R-2425 F2 R1 M29 EMPTY IMP	Total/NA	Air	29/7470A	1153

Client: URS Corporation Project/Site: Suncoke - M5/29 TestAmerica Job ID: 140-8115-1

## Metals (Continued)

### **Analysis Batch: 11616 (Continued)**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-8115-6 MS	R-2426 F2 R1 M29 KMNO4/H2SO4 IMP	Total/NA	Air	29/7470A	11529
140-8115-6 MSD	R-2426 F2 R1 M29 KMNO4/H2SO4 IMP	Total/NA	Air	29/7470A	11529
140-8115-7 MS	R-2427 F2 R1 M29 HCL RINSE	Total/NA	Air	29/7470A	11541
140-8115-7 MSD	R-2427 F2 R1 M29 HCL RINSE	Total/NA	Air	29/7470A	11541

### Prep Batch: 11655

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-8115-3	R-2421,2422,2423 F2 R1 M29 FH COMP	Total/NA	Air	AT Prep (FH)	
140-8115-10	R-2466,2467,2468 F2 R2 M29 FH COMP	Total/NA	Air	AT Prep (FH)	
140-8115-17	R-2511,2512,2513 F2 R3 M29 FH COMP	Total/NA	Air	AT Prep (FH)	
140-8115-28	R-2535,2536,2537 F2 R4 M29 FH COMP	Total/NA	Air	AT Prep (FH)	
140-8115-35	R-2542,2543,2544 F2 R5 M29 FH COMP	Total/NA	Air	AT Prep (FH)	
140-8115-42	R-2549,2550,2551 F2 R6 M29 FH COMP	Total/NA	Air	AT Prep (FH)	
140-8115-51	R-2617,2618,2619 F2 QC M29 FH COMP RB #2	Total/NA	Air	AT Prep (FH)	
140-8115-55	A-6252 MEDIA CHECK FILTER	Total/NA	Air	AT Prep (FH)	
MB 140-11655/9-B	Method Blank	Total/NA	Air	AT Prep (FH)	
LCS 140-11655/10-B	Lab Control Sample	Total/NA	Air	AT Prep (FH)	
LCSD 140-11655/11-B	Lab Control Sample Dup	Total/NA	Air	AT Prep (FH)	

### Cleanup Batch: 11656

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-8115-3	R-2421,2422,2423 F2 R1 M29 FH COMP	Total/NA	Air	AT Prep FH	11655
140-8115-10	R-2466,2467,2468 F2 R2 M29 FH COMP	Total/NA	Air	AT Prep FH	11655
140-8115-17	R-2511,2512,2513 F2 R3 M29 FH COMP	Total/NA	Air	AT Prep FH	11655
140-8115-28	R-2535,2536,2537 F2 R4 M29 FH COMP	Total/NA	Air	AT Prep FH	11655
140-8115-35	R-2542,2543,2544 F2 R5 M29 FH COMP	Total/NA	Air	AT Prep FH	11655
140-8115-42	R-2549,2550,2551 F2 R6 M29 FH COMP	Total/NA	Air	AT Prep FH	11655
140-8115-51	R-2617,2618,2619 F2 QC M29 FH COMP RB #2	Total/NA	Air	AT Prep FH	11655
140-8115-55	A-6252 MEDIA CHECK FILTER	Total/NA	Air	AT Prep FH	11655
MB 140-11655/9-B	Method Blank	Total/NA	Air	AT Prep FH	11655
LCS 140-11655/10-B	Lab Control Sample	Total/NA	Air	AT Prep FH	11655
LCSD 140-11655/11-B	Lab Control Sample Dup	Total/NA	Air	AT Prep FH	11655

### **Analysis Batch: 11672**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-8115-3	R-2421,2422,2423 F2 R1 M29 FH COMP	Total/NA	Air	29/7470A	11656
140-8115-10	R-2466,2467,2468 F2 R2 M29 FH COMP	Total/NA	Air	29/7470A	11656
140-8115-17	R-2511,2512,2513 F2 R3 M29 FH COMP	Total/NA	Air	29/7470A	11656
140-8115-28	R-2535,2536,2537 F2 R4 M29 FH COMP	Total/NA	Air	29/7470A	11656
140-8115-35	R-2542,2543,2544 F2 R5 M29 FH COMP	Total/NA	Air	29/7470A	11656
140-8115-42	R-2549,2550,2551 F2 R6 M29 FH COMP	Total/NA	Air	29/7470A	11656
140-8115-51	R-2617,2618,2619 F2 QC M29 FH COMP RB #2	Total/NA	Air	29/7470A	11656
140-8115-55	A-6252 MEDIA CHECK FILTER	Total/NA	Air	29/7470A	11656
MB 140-11655/9-B	Method Blank	Total/NA	Air	29/7470A	11656
LCS 140-11655/10-B	Lab Control Sample	Total/NA	Air	29/7470A	11656
LCSD 140-11655/11-B	Lab Control Sample Dup	Total/NA	Air	29/7470A	11656

### **Prep Batch: 211848**

	Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
	140-8115-4	R-2424 F2 R1 M29 BH IMP	Total/NA	Air	AT Prep (BH)	:
ı	140-8115-11	R-2469 F2 R2 M29 BH IMP	Total/NA	Air	AT Prep (BH)	

Client: URS Corporation Project/Site: Suncoke - M5/29

TestAmerica Job ID: 140-8115-1

## **Metals (Continued)**

## Prep Batch: 211848 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-8115-18	R-2514 F2 R3 M29 BH IMP	Total/NA	Air	AT Prep (BH)	
140-8115-29	R-2538 F2 R4 M29 BH IMP	Total/NA	Air	AT Prep (BH)	
140-8115-36	R-2545 F2 R5 M29 BH IMP	Total/NA	Air	AT Prep (BH)	
140-8115-43	R-2552 F2 R6 M29 BH IMP	Total/NA	Air	AT Prep (BH)	
140-8115-52	R-2620 F2 QC M29 BH IMP RB #2	Total/NA	Air	AT Prep (BH)	
MB 180-211848/8-A	Method Blank	Total/NA	Air	AT Prep (BH)	
LCS 180-211848/9-A	Lab Control Sample	Total/NA	Air	AT Prep (BH)	
LCSD 180-211848/10-A	Lab Control Sample Dup	Total/NA	Air	AT Prep (BH)	

### **Prep Batch: 212181**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-8115-3	R-2421,2422,2423 F2 R1 M29 FH COMP	Total/NA	Air	AT Prep (FH)	
140-8115-10	R-2466,2467,2468 F2 R2 M29 FH COMP	Total/NA	Air	AT Prep (FH)	
140-8115-17	R-2511,2512,2513 F2 R3 M29 FH COMP	Total/NA	Air	AT Prep (FH)	
140-8115-28	R-2535,2536,2537 F2 R4 M29 FH COMP	Total/NA	Air	AT Prep (FH)	
140-8115-35	R-2542,2543,2544 F2 R5 M29 FH COMP	Total/NA	Air	AT Prep (FH)	
140-8115-42	R-2549,2550,2551 F2 R6 M29 FH COMP	Total/NA	Air	AT Prep (FH)	
140-8115-51	R-2617,2618,2619 F2 QC M29 FH COMP RB #2	Total/NA	Air	AT Prep (FH)	
140-8115-55	A-6252 MEDIA CHECK FILTER	Total/NA	Air	AT Prep (FH)	
MB 180-212181/9-A ^5	Method Blank	Total/NA	Air	AT Prep (FH)	
LCS 180-212181/10-A ^5	Lab Control Sample	Total/NA	Air	AT Prep (FH)	
LCSD 180-212181/11-A ^5	Lab Control Sample Dup	Total/NA	Air	AT Prep (FH)	

#### Analysis Batch: 216315

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-8115-3	R-2421,2422,2423 F2 R1 M29 FH COMP	Total/NA	Air	29/6020A	212181
140-8115-4	R-2424 F2 R1 M29 BH IMP	Total/NA	Air	29/6020A	211848
140-8115-10	R-2466,2467,2468 F2 R2 M29 FH COMP	Total/NA	Air	29/6020A	212181
140-8115-11	R-2469 F2 R2 M29 BH IMP	Total/NA	Air	29/6020A	211848
140-8115-17	R-2511,2512,2513 F2 R3 M29 FH COMP	Total/NA	Air	29/6020A	212181
140-8115-18	R-2514 F2 R3 M29 BH IMP	Total/NA	Air	29/6020A	211848
140-8115-28	R-2535,2536,2537 F2 R4 M29 FH COMP	Total/NA	Air	29/6020A	212181
140-8115-29	R-2538 F2 R4 M29 BH IMP	Total/NA	Air	29/6020A	211848
140-8115-35	R-2542,2543,2544 F2 R5 M29 FH COMP	Total/NA	Air	29/6020A	212181
140-8115-36	R-2545 F2 R5 M29 BH IMP	Total/NA	Air	29/6020A	211848
140-8115-42	R-2549,2550,2551 F2 R6 M29 FH COMP	Total/NA	Air	29/6020A	212181
140-8115-43	R-2552 F2 R6 M29 BH IMP	Total/NA	Air	29/6020A	211848
140-8115-51	R-2617,2618,2619 F2 QC M29 FH COMP RB #2	Total/NA	Air	29/6020A	212181
140-8115-52	R-2620 F2 QC M29 BH IMP RB #2	Total/NA	Air	29/6020A	211848
140-8115-55	A-6252 MEDIA CHECK FILTER	Total/NA	Air	29/6020A	212181
MB 180-211848/8-A	Method Blank	Total/NA	Air	29/6020A	211848
MB 180-212181/9-A ^5	Method Blank	Total/NA	Air	29/6020A	212181
LCS 180-211848/9-A	Lab Control Sample	Total/NA	Air	29/6020A	211848
LCS 180-212181/10-A ^5	Lab Control Sample	Total/NA	Air	29/6020A	212181
LCSD 180-211848/10-A	Lab Control Sample Dup	Total/NA	Air	29/6020A	211848
LCSD 180-212181/11-A ^5	Lab Control Sample Dup	Total/NA	Air	29/6020A	212181

Client: URS Corporation Project/Site: Suncoke - M5/29

TestAmerica Job ID: 140-8115-1

## **General Chemistry**

## Analysis Batch: 11498

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-8115-1	R-2421 F2 R1 M5 FILTER	Total/NA	Air	5	-4 =
140-8115-2	R-2422 F2 R1 M5 ACETONE	Total/NA	Air	5	
140-8115-8	R-2466 F2 R2 M5 FILTER	Total/NA	Air	5	
140-8115-9	R-2467 F2 R2 M5 ACETONE	Total/NA	Air	5	
140-8115-15	R-2511 F2 R3 M5 FILTER	Total/NA	Air	5	
140-8115-16	R-2512 F2 R3 M5 ACETONE	Total/NA	Air	5	
140-8115-26	R-2535 F2 R4 M5 FILTER	Total/NA	Air	5	
140-8115-27	R-2536 F2 R4 M5 ACETONE	Total/NA	Air	5	
140-8115-33	R-2542 F2 R5 M5 FILTER	Total/NA	Air	5	
140-8115-34	R-2543 F2 R5 M5 ACETONE	Total/NA	Air	5	
140-8115-40	R-2549 F2 R6 M5 FILTER	Total/NA	Air	5	
140-8115-41	R-2550 F2 R6 M5 ACETONE	Total/NA	Air	5	
140-8115-49	R-2617 F2 QC M5 FILTER RB #2	Total/NA	Air	5	
140-8115-50	R-2618 F2 QC M5 ACETONE RB #2	Total/NA	Air	5	
140-8115-55	A-6252 MEDIA CHECK FILTER	Total/NA	Air	5	

Client: URS Corporation Project/Site: Suncoke - M5/29 TestAmerica Job ID: 140-8115-1

Client Sample ID: R-2421,2422,2423 F2 R1 M29 FH COMP

Date Collected: 05/08/17 00:00

Date Received: 05/16/17 13:05 Sample Container: Air Train Lab Sample ID: 140-8115-3

Matrix: Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	201		0.500	0.445	ug/Sample		05/24/17 12:00	07/05/17 20:14	5
Beryllium	2.47	В	0.500	0.0850	ug/Sample		05/24/17 12:00	07/05/17 20:14	5
Cadmium	13.6		0.500	0.365	ug/Sample		05/24/17 12:00	07/05/17 20:14	5
Cobalt	10.6		0.250	0.0873	ug/Sample		05/24/17 12:00	07/05/17 20:14	5
Chromium	12.9		10.0	8.00	ug/Sample		05/24/17 12:00	07/05/17 20:14	5
Lead	629		0.750	0.600	ug/Sample		05/24/17 12:00	07/05/17 20:14	5
Antimony	36.8		1.00	0.900	ug/Sample		05/24/17 12:00	07/05/17 20:14	5
Nickel	61.4		6.00	5.00	ug/Sample		05/24/17 12:00	07/05/17 20:14	5
Manganese	13.7		2.50	1.70	ug/Sample		05/24/17 12:00	07/05/17 20:14	5
Selenium	66.1		2.50	0.150	ug/Sample		05/24/17 12:00	07/05/17 20:14	5
Method: 29/7470A - Me	ercury (CVAA), Stat	ionary Sou	rce						
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.188	J	0.200	0.0800	ug/Sample		05/24/17 12:00	05/30/17 15:12	1

Client: URS Corporation Project/Site: Suncoke - M5/29 TestAmerica Job ID: 140-8115-1

Client Sample ID: R-2424 F2 R1 M29 BH IMP

Date Collected: 05/08/17 00:00

Date Received: 05/16/17 13:05 Sample Container: Air Train

Lab Sample ID: 140-8115-4

Matrix: Air

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	45.1	В	0.100	0.0110	ug/Sample	-	05/22/17 09:22	07/05/17 19:01	1
Beryllium	0.0176	J	0.100	0.00233	ug/Sample		05/22/17 09:22	07/05/17 19:01	1
Cadmium	0.122		0.100	0.0195	ug/Sample		05/22/17 09:22	07/05/17 19:01	1
Cobalt	0.144		0.0700	0.0600	ug/Sample		05/22/17 09:22	07/05/17 19:01	1
Chromium	6.58		0,200	0.0507	ug/Sample		05/22/17 09:22	07/05/17 19:01	1
Lead	6.00		0.100	0.0300	ug/Sample		05/22/17 09:22	07/05/17 19:01	1
Antimony	0.613		0.300	0.240	ug/Sample		05/22/17 09:22	07/05/17 19:01	1
Nickel	1.72	В	0.100	0.0291	ug/Sample		05/22/17 09:22	07/05/17 19:01	1
Manganese	2.23		0.500	0.105	ug/Sample		05/22/17 09:22	07/05/17 19:01	1
Selenium	112		0.500	0.0279	ug/Sample		05/22/17 09:22	07/05/17 19:01	1
Method: 29/7470A - M	ercury (CVAA), Stat	ionary Sou	ırce						
Analyte	* * * **	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	13.7		0.400	0.120	ug/Sample	-	05/25/17 09:00	05/26/17 11:33	1

Client: URS Corporation Project/Site: Suncoke - M5/29 TestAmerica Job ID: 140-8115-1

Client Sample ID: R-2425 F2 R1 M29 EMPTY IMP

Lab Sample ID: 140-8115-5

Date Collected: 05/08/17 00:00 Date Received: 05/16/17 13:05 Sample Container: Air Train

Matrix: Air

Method: 29/7470A - Mercury (CVAA), Stationary Source

Analyte Result Qualifier RL MDL Unit D Prepared Analyzed Dil Fac Hg 2.40 0.180 0.0540 ug/Sample 05/25/17 09:00 05/26/17 12:05

Client: URS Corporation Project/Site: Suncoke - M5/29 TestAmerica Job ID: 140-8115-1

Client Sample ID: R-2426 F2 R1 M29 KMNO4/H2SO4 IMP

Lab Sample ID: 140-8115-6

Date Collected: 05/08/17 00:00

Matrix: Air

Date Received: 05/16/17 13:05 Sample Container: Air Train

Method: 29/7470A - Mercury (CVAA), Stationary Source

 Analyte
 Result Qualifier
 RL 0.160
 MDL unit ug/Sample
 D Prepared 0.5/25/17 09:00
 Analyzed 0.5/26/17 12:35
 Dil Fac 0.0480

Client: URS Corporation Project/Site: Suncoke - M5/29 TestAmerica Job ID: 140-8115-1

Client Sample ID: R-2427 F2 R1 M29 HCL RINSE

Lab Sample ID: 140-8115-7

Date Collected: 05/08/17 00:00

Matrix: Air

Date Received: 05/16/17 13:05 Sample Container: Air Train

Method: 29/7470A - Mercury (CVAA), Stationary Source

 Analyte
 Result
 Qualifier
 RL
 MDL Unit
 D
 Prepared
 Analyzed
 Dil Fac

 Hg
 7.89
 0.290
 0.0870
 ug/Sample
 05/25/17 09:00
 05/26/17 13:08
 1

Client: URS Corporation Project/Site: Suncoke - M5/29 TestAmerica Job ID: 140-8115-1

Client Sample ID: R-2466,2467,2468 F2 R2 M29 FH COMP

Lab Sample ID: 140-8115-10

Date Collected: 05/08/17 00:00 Date Received: 05/16/17 13:05 Sample Container: Air Train

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	230		0.500	0.445	ug/Sample		05/24/17 12:00	07/05/17 20:47	5
Beryllium	2.41	В	0.500	0.0850	ug/Sample		05/24/17 12:00	07/05/17 20:47	5
Cadmium	14.5		0.500	0.365	ug/Sample		05/24/17 12:00	07/05/17 20:47	5
Cobalt	11.6		0.250	0.0873	ug/Sample		05/24/17 12:00	07/05/17 20:47	5
Chromium	13.7		10.0	8.00	ug/Sample		05/24/17 12:00	07/05/17 20:47	5
Lead	1070		0.750	0.600	ug/Sample		05/24/17 12:00	07/05/17 20:47	5
Antimony	42.3		1.00	0.900	ug/Sample		05/24/17 12:00	07/05/17 20:47	5
Nickel	79.8		6.00	5.00	ug/Sample		05/24/17 12:00	07/05/17 20:47	5
Manganese	11.7		2,50	1.70	ug/Sample		05/24/17 12:00	07/05/17 20:47	5
Selenium	87.1		2,50	0.150	ug/Sample		05/24/17 12:00	07/05/17 20:47	5
Method: 29/7470A - Mo	ercury (CVAA), Stat	ionary Sour	ce						
Analyte	and the same of th	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.321		0.200	0.0800	ug/Sample		05/24/17 12:00	05/30/17 15:19	1

Client: URS Corporation Project/Site: Suncoke - M5/29 TestAmerica Job ID: 140-8115-1

Client Sample ID: R-2469 F2 R2 M29 BH IMP

Date Collected: 05/08/17 00:00

Date Received: 05/16/17 13:05 Sample Container: Air Train

Lab Sample ID: 140-8115-11

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	61.1	В	0.100	0.0110	ug/Sample		05/22/17 09:22	07/05/17 19:18	1
Beryllium	0.0325	J	0.100	0.00233	ug/Sample		05/22/17 09:22	07/05/17 19:18	1
Cadmium	0.0286	J	0.100	0.0195	ug/Sample		05/22/17 09:22	07/05/17 19:18	1
Cobalt	0.0785		0.0700	0.0600	ug/Sample		05/22/17 09:22	07/05/17 19:18	1
Chromium	4.71		0.200	0.0507	ug/Sample		05/22/17 09:22	07/05/17 19:18	1
Lead	4.69		0.100	0.0300	ug/Sample		05/22/17 09:22	07/05/17 19:18	1
Antimony	0.576		0.300	0.240	ug/Sample		05/22/17 09:22	07/05/17 19:18	1
Nickel	1.77	В	0.100	0.0291	ug/Sample		05/22/17 09:22	07/05/17 19:18	1
Manganese	2.04		0.500	0.105	ug/Sample		05/22/17 09:22	07/05/17 19:18	1
Selenium	128		0.500	0.0279	ug/Sample		05/22/17 09:22	07/05/17 19:18	1
Method: 29/7470A - M	ercury (CVAA), Stat	ionary Sou	rce						
Analyte	The second of th	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	18.5		0.400	0.120	ug/Sample	V 1	05/25/17 09:00	05/26/17 11:40	1

Client: URS Corporation Project/Site: Suncoke - M5/29 TestAmerica Job ID: 140-8115-1

Client Sample ID: R-2470 F2 R2 M29 EMPTY IMP

Lab Sample ID: 140-8115-12

Matrix: Air

Date Collected: 05/08/17 00:00 Date Received: 05/16/17 13:05 Sample Container: Air Train

Method: 29/7470A - Mercury (CVAA), Stationary Source

 Analyte
 Result
 Qualifier
 RL
 MDL
 Unit
 D
 Prepared
 Analyzed
 Dil Fac

 Hg
 1.40
 0.100
 0.0300
 ug/Sample
 05/25/17 09:00
 05/26/17 12:12
 1

Client: URS Corporation

Project/Site: Suncoke - M5/29

TestAmerica Job ID: 140-8115-1

Client Sample ID: R-2471 F2 R2 M29 KMNO4/H2SO4 IMP Lab Sample ID: 140-8115-13 Matrix: Air

Date Collected: 05/08/17 00:00 Date Received: 05/16/17 13:05

Sample Container: Air Train

Method: 29/7470A - Mercury (CVAA), Stationary Source

Result Qualifier Analyte RL MDL Unit D Prepared **Analyzed Dil Fac** 05/25/17 09:00 05/26/17 12:43 0.240 0.152 0.0456 ug/Sample Hg

Client: URS Corporation Project/Site: Suncoke - M5/29 TestAmerica Job ID: 140-8115-1

Client Sample ID: R-2472 F2 R2 M29 HCL RINSE

Lab Sample ID: 140-8115-14

Date Collected: 05/08/17 00:00

Matrix: Air

Date Received: 05/16/17 13:05 Sample Container: Air Train

Method: 29/7470A - Mercury (CVAA), Stationary Source

 Analyte
 Result Hg
 Qualifier
 RL
 MDL Unit ug/Sample
 D Prepared 05/25/17 09:00
 Analyzed 05/26/17 13:15
 Dil Fac 05/25/17 09:00

Client: URS Corporation Project/Site: Suncoke - M5/29 TestAmerica Job ID: 140-8115-1

Client Sample ID: R-2511,2512,2513 F2 R3 M29 FH COMP

Date Collected: 05/09/17 00:00

Date Received: 05/16/17 13:05 Sample Container: Air Train

Lab Sample ID: 140-8115-17

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	140		0.500	0.445	ug/Sample		05/24/17 12:00	07/05/17 20:51	- 5
Beryllium	2.13	В	0.500	0.0850	ug/Sample		05/24/17 12:00	07/05/17 20:51	5
Cadmium	16.1		0.500	0.365	ug/Sample		05/24/17 12:00	07/05/17 20:51	5
Cobalt	9.67		0.250	0.0873	ug/Sample		05/24/17 12:00	07/05/17 20:51	5
Chromium	11.7		10.0	8.00	ug/Sample		05/24/17 12:00	07/05/17 20:51	5
Lead	847		0.750	0.600	ug/Sample		05/24/17 12:00	07/05/17 20:51	5
Antimony	35.1		1.00	0.900	ug/Sample		05/24/17 12:00	07/05/17 20:51	5
Nickel	63.0		6.00	5.00	ug/Sample		05/24/17 12:00	07/05/17 20:51	5
Manganese	12.1		2.50	1.70	ug/Sample		05/24/17 12:00	07/05/17 20:51	5
Selenium	10.4		2,50	0.150	ug/Sample		05/24/17 12:00	07/05/17 20:51	5
Method: 29/7470A - Me	ercury (CVAA), Stat	ionary Sour	rce						
Analyte	to the total of the second sec	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND ND		0.200	0.0800	ug/Sample		05/24/17 12:00	05/30/17 15:22	1

Client: URS Corporation Project/Site: Suncoke - M5/29 TestAmerica Job ID: 140-8115-1

Client Sample ID: R-2514 F2 R3 M29 BH IMP

Date Collected: 05/09/17 00:00 Date Received: 05/16/17 13:05

Sample Container: Air Train

Lab Sample ID: 140-8115-18

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	136	В	0.100	0.0110	ug/Sample		05/22/17 09:22	07/05/17 19:22	1
Beryllium	0.0236	J	0.100	0.00233	ug/Sample		05/22/17 09:22	07/05/17 19:22	1
Cadmium	0.0575	J	0.100	0.0195	ug/Sample		05/22/17 09:22	07/05/17 19:22	1
Cobalt	0.0604	J	0.0700	0.0600	ug/Sample		05/22/17 09:22	07/05/17 19:22	1
Chromium	4.51		0.200	0.0507	ug/Sample		05/22/17 09:22	07/05/17 19:22	1
Lead	2.64		0.100	0.0300	ug/Sample		05/22/17 09:22	07/05/17 19:22	1
Antimony	1.05		0.300	0.240	ug/Sample		05/22/17 09:22	07/05/17 19:22	1
Nickel	2.58	В	0.100	0.0291	ug/Sample		05/22/17 09:22	07/05/17 19:22	1
Manganese	2.72		0.500	0.105	ug/Sample		05/22/17 09:22	07/05/17 19:22	1
Selenium	159		0.500	0.0279	ug/Sample		05/22/17 09:22	07/05/17 19:22	1
Method: 29/7470A - M	ercury (CVAA), Stat	ionary Sou	irce						
Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	19.0		0.800	0.240	ug/Sample	-	05/25/17 09:00	05/26/17 13:45	2

Client: URS Corporation Project/Site: Suncoke - M5/29 TestAmerica Job ID: 140-8115-1

Client Sample ID: R-2515 F2 R3 M29 EMPTY IMP

Lab Sample ID: 140-8115-19

Date Collected: 05/09/17 00:00

Matrix: Air

Date Received: 05/16/17 13:05 Sample Container: Air Train

Method: 29/7470A - Mercury (CVAA), Stationary Source

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	2.34		0.100	0.0300	ug/Sample	_	05/25/17 09:00	05/26/17 12:15	1

Client: URS Corporation Project/Site: Suncoke - M5/29

TestAmerica Job ID: 140-8115-1

Client Sample ID: R-2516 F2 R3 M29 KMNO4/H2SO4 IMP Lab Sample ID: 140-8115-20

Date Collected: 05/09/17 00:00

Date Received: 05/16/17 13:05 Sample Container: Air Train

Method: 29/7470A - Mercury (C	:VAA), Stat	ionary Soul	ce						
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.546		0.152	0.0456	ug/Sample		05/25/17 09:00	05/26/17 12:45	1

Client: URS Corporation Project/Site: Suncoke - M5/29 TestAmerica Job ID: 140-8115-1

Client Sample ID: R-2517 F2 R3 M29 HCL RINSE IMP

Lab Sample ID: 140-8115-21 Matrix: Air

Date Collected: 05/09/17 00:00 Date Received: 05/16/17 13:05

Sample Container: Air Train

Method: 29/7470A - Mercury (CVAA), Stationary Source

Analyte Result Qualifier RL MDL Unit D Prepared Analyzed Dil Fac Hg 6.36 0.280 0.0840 ug/Sample 05/25/17 09:00 05/26/17 13:17

Client: URS Corporation Project/Site: Suncoke - M5/29 TestAmerica Job ID: 140-8115-1

Client Sample ID: R-2617,2618,2619 F2 QC M29 FH COMP RB

Lab Sample ID: 140-8115-51

#2

Date Collected: 05/11/17 00:00

Matrix: Air

Date Received: 05/16/17 13:05 Sample Container: Air Train

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.500	0.445	ug/Sample	_	05/24/17 12:00	07/05/17 21:07	5
Beryllium	ND		0.500	0.0850	ug/Sample		05/24/17 12:00	07/05/17 21:07	5
Cadmium	ND		0.500	0.365	ug/Sample		05/24/17 12:00	07/05/17 21:07	15
Cobalt	ND		0.250	0.0873	ug/Sample		05/24/17 12:00	07/05/17 21:07	5
Chromium	ND		10.0	8.00	ug/Sample		05/24/17 12:00	07/05/17 21:07	5
Lead	ND		0.750	0.600	ug/Sample		05/24/17 12:00	07/05/17 21:07	5
Antimony	ND		1.00	0,900	ug/Sample		05/24/17 12:00	07/05/17 21:07	5
Nickel	ND		6.00	5.00	ug/Sample		05/24/17 12:00	07/05/17 21:07	5
Manganese	ND		2.50	1.70	ug/Sample		05/24/17 12:00	07/05/17 21:07	5
Selenium	0.333	J	2.50	0.150	ug/Sample		05/24/17 12:00	07/05/17 21:07	5
Method: 29/7470A - M	ercury (CVAA), Stat	ionary Soui	rce						
Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.200	0.0800	ug/Sample	-	05/24/17 12:00	05/30/17 15:37	1

07/06/2017

Client: URS Corporation Project/Site: Suncoke - M5/29 TestAmerica Job ID: 140-8115-1

Client Sample ID: R-2620 F2 QC M29 BH IMP RB #2

Date Collected: 05/11/17 00:00

Date Received: 05/16/17 13:05 Sample Container: Air Train

Lab Sample ID: 140-8115-52

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.455	В	0.100	0.0110	ug/Sample		05/22/17 09:22	07/05/17 19:54	1
Beryllium	0.0238	J	0.100	0.00233	ug/Sample		05/22/17 09:22	07/05/17 19:54	1
Cadmium	ND		0.100	0.0195	ug/Sample		05/22/17 09:22	07/05/17 19:54	1
Cobalt	ND		0.0700	0.0600	ug/Sample		05/22/17 09:22	07/05/17 19:54	1
Chromium	10.6		0.200	0.0507	ug/Sample		05/22/17 09:22	07/05/17 19:54	1
Lead	0.0791	J	0.100	0.0300	ug/Sample		05/22/17 09:22	07/05/17 19:54	1
Antimony	0.294	J	0.300	0.240	ug/Sample		05/22/17 09:22	07/05/17 19:54	1
Nickel	0.791	В	0.100	0.0291	ug/Sample		05/22/17 09:22	07/05/17 19:54	1
Manganese	0.757		0.500	0.105	ug/Sample		05/22/17 09:22	07/05/17 19:54	1
Selenium	0.197	J	0.500	0.0279	ug/Sample		05/22/17 09:22	07/05/17 19:54	1
Method: 29/7470A - M	ercury (CVAA), Stat	ionary Sou	ırce						
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.148	J	0.400	0.120	ug/Sample	_	05/25/17 09:00	05/26/17 11:57	1

Client: URS Corporation

Project/Site: Suncoke - M5/29

TestAmerica Job ID: 140-8115-1

Client Sample ID: R-2622 F2 QC M29 KMNO4/H2SO4 IMP RB

Lab Sample ID: 140-8115-53

#2

Date Collected: 05/11/17 00:00

Matrix: Air

Date Received: 05/16/17 13:05 Sample Container: Air Train

Method: 29/7470A - Mercury (CVAA), Stationary Source

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND	···	0.0400	0.0120	ug/Sample	-	05/25/17 09:00	05/26/17 13:00	1

Client: URS Corporation Project/Site: Suncoke - M5/29 TestAmerica Job ID: 140-8115-1

Client Sample ID: R-2623 F2 QC M29 HCL RINSE RB #2 Lab Sample ID: 140-8115-54

Date Collected: 05/11/17 00:00

Matrix: Air

Date Received: 05/16/17 13:05 Sample Container: Air Train

Method: 29/7470A - Mercury (CVAA), Stationary Source

 Analyte
 Result ND
 Qualifier
 RL ND
 MDL Unit ug/Sample
 D Unit ug/Sample
 D 05/25/17 09:00
 Analyzed 05/26/17 13:42
 Dil Fac 05/25/17 09:00

Client: URS Corporation Project/Site: Suncoke - M5/29 TestAmerica Job ID: 140-8115-1

# Client Sample ID: A-6252 MEDIA CHECK FILTER

Date Collected: 05/08/17 00:00

Date Received: 05/16/17 13:05 Sample Container: Petri/Filter

Lab Sample ID: 140-8115-55

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.500	0.445	ug/Sample	-	05/24/17 12:00	07/05/17 21:12	- 5
Beryllium	ND		0.500	0.0850	ug/Sample		05/24/17 12:00	07/05/17 21:12	5
Cadmium	ND		0.500	0.365	ug/Sample		05/24/17 12:00	07/05/17 21:12	5
Cobalt	ND		0.250	0.0873	ug/Sample		05/24/17 12:00	07/05/17 21:12	5
Chromium	ND		10.0	8.00	ug/Sample		05/24/17 12:00	07/05/17 21:12	5
Lead	ND		0.750	0.600	ug/Sample		05/24/17 12:00	07/05/17 21:12	5
Antimony	ND		1.00	0.900	ug/Sample		05/24/17 12:00	07/05/17 21:12	5
Nickel	ND		6.00	5.00	ug/Sample		05/24/17 12:00	07/05/17 21:12	5
Manganese	ND		2.50	1.70	ug/Sample		05/24/17 12:00	07/05/17 21:12	5
Selenium	ND		2.50	0.150	ug/Sample		05/24/17 12:00	07/05/17 21:12	5
Method: 29/7470A - Mercu	ry (CVAA), Stat	ionary Sou	rce						
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.200	0.0800	ug/Sample	-	05/24/17 12:00	05/30/17 15:39	1
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Particulates, Total	0.955		0.500	0.500	mg/sample	-		05/23/17 09:42	1

#### **Default Detection Limits**

Client: URS Corporation Project/Site: Suncoke - M5/29 TestAmerica Job ID: 140-8115-1

Prep: AT Prep (BH)

Analyte	RL	MDL	Units	Method
Antimony	0.300	0.240	ug/Sample	29/6020A
Arsenic	0.100	0.0110	ug/Sample	29/6020A
Beryllium	0.100	0.00233	ug/Sample	29/6020A
Cadmium	0.100	0.0195	ug/Sample	29/6020A
Chromium	0.200	0.0507	ug/Sample	29/6020A
Cobalt	0.0700	0.0600	ug/Sample	29/6020A
Lead	0.100	0.0300	ug/Sample	29/6020A
Manganese	0,500	0.105	ug/Sample	29/6020A
Nickel	0.100	0.0291	ug/Sample	29/6020A
Selenium	0,500	0.0279	ug/Sample	29/6020A

### Method: 29/6020A - Metals (ICPMS), Stationary Source

Prep: AT Prep (FH)

Analyte	RL	MDL	Units	Method	
Antimony	0.200	0.180	ug/Sample	29/6020A	
Arsenic	0.100	0.0890	ug/Sample	29/6020A	
Beryllium	0.100	0.0170	ug/Sample	29/6020A	
Cadmium	0.100	0.0730	ug/Sample	29/6020A	
Chromium	2.00	1.60	ug/Sample	29/6020A	
Cobalt	0.0500	0,0175	ug/Sample	29/6020A	
Lead	0.150	0.120	ug/Sample	29/6020A	
Manganese	0.500	0.340	ug/Sample	29/6020A	
Nickel	1.20	1.00	ug/Sample	29/6020A	
Selenium	0.500	0.0300	ug/Sample	29/6020A	

### Method: 29/7470A - Mercury (CVAA), Stationary Source

Prep: AT Prep (BH)

Analyte	RL	MDL	Units	Method	
Hg	0.400	0.120	ug/Sample	29/7470A	

# Method: 29/7470A - Mercury (CVAA), Stationary Source

Prep: AT Prep (Empty)

Ì	Analyte	RL	MDL	Units	Method	
	Hg	0.200	0.0600	ug/Sample	29/7470A	

### Method: 29/7470A - Mercury (CVAA), Stationary Source

Prep: AT Prep (FH)

i	Amakida	DI	MDL	11-14-	84-41 4	
М	Analyte	RL		Units	Method	
	Hg	0.200	0.0800	ug/Sample	29/7470A	

## Method: 29/7470A - Mercury (CVAA), Stationary Source

Prep: AT Prep (HCI)

Analyte	RL	MDL	Units	Method	
Hg	0.0500	0.0150	ug/Sample	29/7470A	

## Method: 29/7470A - Mercury (CVAA), Stationary Source

Prep: AT Prep (KMnO4)

# **Default Detection Limits**

Client: URS Corporation Project/Site: Suncoke - M5/29 TestAmerica Job ID: 140-8115-1

Method: 29/7470A - Mercury	(CVAA), Stationary Source
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Prep: AT Prep (KMnO4)

Analyte	RL	MDL	Units	Method	
Hg	0.0200	0.00600	ug/Sample	29/7470A	

# **General Chemistry**

Analyte	RL	MDL	Units	Method
Particulates, Total	0.500	0.500	mg/sample	5

Client: URS Corporation Project/Site: Suncoke - M5/29

TestAmerica Job ID: 140-8115-1

## Method: 29/6020A - Metals (ICPMS), Stationary Source

RAD RAD

Lab Sample ID: MB 180-211848/8-A

**Matrix: Air** 

Analysis Batch: 216315

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 211848

	MR	MR							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.03440	J	0.100	0.0110	ug/Sample		05/22/17 09:22	07/05/17 18:41	1
Beryllium	ND		0.100	0.00233	ug/Sample		05/22/17 09:22	07/05/17 18:41	1
Cadmium	ND		0.100	0.0195	ug/Sample		05/22/17 09:22	07/05/17 18:41	1
Cobalt	ND		0.0700	0.0600	ug/Sample		05/22/17 09:22	07/05/17 18:41	1
Chromium	ND		0.200	0.0507	ug/Sample		05/22/17 09:22	07/05/17 18:41	1
Lead	ND		0.100	0.0300	ug/Sample		05/22/17 09:22	07/05/17 18:41	1
Antimony	ND		0.300	0.240	ug/Sample		05/22/17 09:22	07/05/17 18:41	1
Nickel	0.05730	J	0.100	0.0291	ug/Sample		05/22/17 09:22	07/05/17 18:41	1
Manganese	ND		0.500	0.105	ug/Sample		05/22/17 09:22	07/05/17 18:41	1
Selenium	ND		0.500	0.0279	ug/Sample		05/22/17 09:22	07/05/17 18:41	1

Lab Sample ID: LCS 180-211848/9-A

Matrix: Air

Analysis Batch: 216315

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

**Prep Batch: 211848** 

	Spike	LCS	LCS				%Rec.
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits
Arsenic	4.00	3.967		ug/Sample	_	99	80 - 120
Beryllium	5.00	4.287		ug/Sample		86	80 - 120
Cadmium	5.00	5.230		ug/Sample		105	80 - 120
Cobalt	50.0	46.84		ug/Sample		94	80 - 120
Chromium	20.0	23.38		ug/Sample		117	80 - 120
Lead	2.00	1.999		ug/Sample		100	80 - 120
Antimony	50.0	48.94		ug/Sample		98	80 - 120
Nickel	50.0	45.75		ug/Sample		92	80 - 120
Manganese	50.0	45.19		ug/Sample		90	80 - 120
Selenium	1.00	0.8947		ug/Sample		89	80 - 120

Lab Sample ID: LCSD 180-211848/10-A

Matrix: Air

Analysis Batch: 216315

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA **Prep Batch: 211848** 

•	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Arsenic	4.00	3.643		ug/Sample	_	91	80 - 120	9	20
Beryllium	5.00	4.503		ug/Sample		90	80 - 120	5	20
Cadmium	5.00	5.389		ug/Sample		108	80 - 120	3	20
Cobalt	50.0	47.28		ug/Sample		95	80 - 120	1	20
Chromium	20.0	22.60		ug/Sample		113	80 - 120	3	20
Lead	2.00	2,079		ug/Sample		104	80 - 120	4	20
Antimony	50.0	50.46		ug/Sample		101	80 - 120	3	20
Nickel	50.0	45.62		ug/Sample		91	80 - 120	0	20
Manganese	50.0	47.33		ug/Sample		95	80 - 120	5	20
Selenium	1.00	1.004		ug/Sample		100	80 - 120	12	20

Lab Sample ID: MB 180-212181/9-A ^5

Matrix: Air

Analysis Batch: 216315

Client Sample ID: Method Blank Prep Type: Total/NA

**Prep Batch: 212181** 

	IND	INID							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.500	0.445	ug/Sample	_	05/24/17 12:00	07/05/17 20:02	5

TestAmerica Knoxville

Client: URS Corporation Project/Site: Suncoke - M5/29 TestAmerica Job ID: 140-8115-1

### Method: 29/6020A - Metals (ICPMS), Stationary Source (Continued)

MD MD

Lab Sample ID: MB 180-212181/9-A ^5

Matrix: Air

Analysis Batch: 216315

Client Sample ID: Method Blank

Prep Type: Total/NA Prep Batch: 212181

	IVID	IVID							
Analyte	Result	Qualifier	RL	. MDL	Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	0.1330	J	0.500	0.0850	ug/Sample	= ==	05/24/17 12:00	07/05/17 20:02	5
Cadmium	ND		0.500	0.365	ug/Sample		05/24/17 12:00	07/05/17 20:02	5
Cobalt	ND		0.250	0.0873	ug/Sample		05/24/17 12:00	07/05/17 20:02	5
Chromium	ND		10.0	8.00	ug/Sample		05/24/17 12:00	07/05/17 20:02	5
Lead	ND		0.750	0.600	ug/Sample		05/24/17 12:00	07/05/17 20:02	5
Antimony	ND		1.00	0.900	ug/Sample		05/24/17 12:00	07/05/17 20:02	5
Nickel	ND		6.00	5.00	ug/Sample		05/24/17 12:00	07/05/17 20:02	5
Manganese	ND		2.50	1.70	ug/Sample		05/24/17 12:00	07/05/17 20:02	5
Selenium	ND		2.50	0.150	ug/Sample		05/24/17 12:00	07/05/17 20:02	5

Lab Sample ID: LCS 180-212181/10-A ^5

Matrix: Air

Analysis Batch: 216315

Client Sample ID: Lab Control Sample

Prep Type: Total/NA Prep Batch: 212181

Spike LCS LCS %Rec. Analyte Added Result Qualifier Unit %Rec Limits Arsenic 4.00 3.628 ug/Sample 91 80 - 120 Beryllium 5.00 4.363 ug/Sample 87 80 - 120 Cadmium 5.00 5.045 ug/Sample 101 80 - 120 Cobalt 50.0 48.07 ug/Sample 96 80 - 120 Chromium 20.0 20.74 ug/Sample 80 - 120 104 Lead 2.00 2.039 ug/Sample 102 80 - 120 Antimony 50.0 50.20 ug/Sample 100 80 - 120 Nickel 50.0 48.13 ug/Sample 96 80 - 12050.0 Manganese 51.80 ug/Sample 104 80 - 120 Selenium 1.00 1.185 J ug/Sample 119 80 - 120

Lab Sample ID: LCSD 180-212181/11-A ^5

Matrix: Air

**Analysis Batch: 216315** 

Client Sample ID: Lab Control Sample Dup Prep Type: Total/NA

Prep Type. Total/NA Prep Batch: 212181

Spike LCSD LCSD %Rec. **RPD** Analyte Added Result Qualifier Unit %Rec Limits **RPD** Limit Arsenic 4.00 3.526 ug/Sample 88 80 - 120 3 20 Beryllium 5.00 4.200 ug/Sample 84 80 - 120 4 20 Cadmium 5.00 5.430 ug/Sample 109 80 - 120 7 20 Cobalt 50.0 49.97 ug/Sample 80 - 120 100 4 20 Chromium 20.0 21.10 ug/Sample 106 80 - 120 2 20 Lead 2.00 1.998 ug/Sample 100 80 - 120 2 20 **Antimony** 50.0 49.60 ug/Sample 99 80 - 120 1 20 Nickel 50.0 50.85 80 - 120 5 20 ug/Sample 102 50.0 Manganese 52.40 ug/Sample 105 80 - 120 1 20 Selenium 1.00 1.047 J ug/Sample 105 80 - 120 12 20

07/06/2017

Client: URS Corporation Project/Site: Suncoke - M5/29

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TestAmerica Job ID: 140-8115-1

Method: 29/7470A - Mercui	y (CVAA), Stationary Source
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Lab Sample ID: MB 140-11528/10-B Client Sample ID: Method Blank Matrix: Air Prep Type: Total/NA **Analysis Batch: 11616** Prep Batch: 11529 MR MR Result Qualifier RL MDL Unit Dil Fac Prepared Analyzed 0.0200 Hg  $\overline{ND}$ 0.00600 ug/Sample 05/25/17 09:00 05/26/17 12:31 Lab Sample ID: LCS 140-11528/11-B Client Sample ID: Lab Control Sample Matrix: Air Prep Type: Total/NA Analysis Batch: 11616 Prep Batch: 11529 Spike LCS LCS %Rec. Analyte Added Result Qualifier Unit %Rec Limits Hg 0.500 0.4970 ug/Sample 80 - 120 99 Lab Sample ID: 140-8115-6 MS Client Sample ID: R-2426 F2 R1 M29 KMNO4/H2SO4 IMP Matrix: Air Prep Type: Total/NA **Analysis Batch: 11616** Prep Batch: 11529 Spike MS MS Sample Sample %Rec. **Analyte** Result Qualifier Added Result Qualifier %Rec Limits Unit Hg 0.559 0.800 1.272 ug/Sample 89 80 - 120 Lab Sample ID: 140-8115-6 MSD Client Sample ID: R-2426 F2 R1 M29 KMNO4/H2SO4 IMP Matrix: Air Prep Type: Total/NA **Analysis Batch: 11616** Prep Batch: 11529 Sample Sample Spike MSD MSD %Rec. **RPD** Added Result Qualifier Result Qualifier **Analyte** Unit %Rec Limits **RPD** Limit Hq 0.559 0.800 1.336 80 - 120 ug/Sample Lab Sample ID: MB 140-11538/9-B Client Sample ID: Method Blank Matrix: Air Prep Type: Total/NA **Analysis Batch: 11616** Prep Batch: 11539 MB MB Result Qualifier RL MDL Unit Analyte Prepared Analyzed Dil Fac Hg ND 0.200 0.0600 ug/Sample 05/25/17 09:00 05/26/17 11:59 Lab Sample ID: LCS 140-11538/10-B Client Sample ID: Lab Control Sample Matrix: Air Prep Type: Total/NA Analysis Batch: 11616 Prep Batch: 11539 Spike LCS LCS %Rec. Added Analyte Result Qualifier Unit %Rec Limits Hq 5.00 5.070 ug/Sample 80 - 120 101 Lab Sample ID: 140-8115-5 MS Client Sample ID: R-2425 F2 R1 M29 EMPTY IMP Matrix: Air Prep Type: Total/NA **Analysis Batch: 11616** Prep Batch: 11539 Sample Sample Spike MS MS %Rec. Result Qualifier Added Analyte Result Qualifier Unit %Rec Limits Hg 2.40 0.900 3.321 ug/Sample 102 80 - 120 Lab Sample ID: 140-8115-5 MSD Client Sample ID: R-2425 F2 R1 M29 EMPTY IMP Matrix: Air Prep Type: Total/NA **Analysis Batch: 11616** Prep Batch: 11539 Sample Sample Spike MSD MSD %Rec. **RPD** Result Qualifier Added Limits Analyte Result Qualifier Unit %Rec RPD Limit

TestAmerica Knoxville

3.312

ug/Sample

101

0.900

2.40

Client: URS Corporation Project/Site: Suncoke - M5/29 TestAmerica Job ID: 140-8115-1

Matrix: Air	540/10-B								UIII	eiit Əğifl	ple ID: Met Prep Type	e: Tot	tal/NA
Analysis Batch: 11616											Prep Ba	tch:	1154
Analyte	Re	MB MB esult Qual	lifier		RL		MDL Unit	D	Р	repared	Analyze	d	Dil Fa
Hg		ND Qual		0.	.0500		0150 ug/S			25/17 09:00			Dilla
Lab Sample ID: LCS 140-11	1540/11-B							Client	Sai	mple ID:	: Lab Cont	rol Sa	ample
Matrix: Air											Prep Type		
Analysis Batch: 11616											Prep Ba		
-				Spike		LCS	LCS				%Rec.		
Analyte				Added			Qualifier	Unit	D	%Rec	Limits		
-lg				1.25		1.220		ug/Sample		98	80 - 120		
_ab Sample ID: 140-8115-7 Matrix: Air	MS						Client	Sample II	D: R	2427 F	2 R1 M29 H Prep Type		
Analysis Batch: 11616											Prep Ba		
•	Sample	Sample		Spike		MS	MS				%Rec.		
Analyte	Result	Qualifier		Added		Result	Qualifier	Unit	D	%Rec	Limits		
-lg	7.89			1.45		9.280	4	ug/Sample		96	80 - 120		
_ab Sample ID: 140-8115-7 Matrix: Air	MSD						Client	Sample II	D: R	2-2427 F	2 R1 M29 H Prep Type		
Analysis Batch: 11616											Prep Ba		
•	Sample	Sample		Spike		MSD	MSD				%Rec.		RP
Analyte		Qualifier		Added		Result	Qualifier	Unit	D	%Rec	Limits	RPD	Lim
<del>l</del> g	7.89			1.45		9.280	4	ug/Sample		96	80 - 120	0	2
										_			
Matrix: Air	542/10-B	MB MB							Clie	ent Sam	ple ID: Met Prep Type Prep Ba	e: Tot	tal/N/
Matrix: Air Analysis Batch: 11616 Analyte		sult Qual	ifier		RL		MDL Unit		P	repared	Prep Type Prep Ba	e: Tot itch: '	tal/N/ 1154:
Matrix: Air Analysis Batch: 11616 <sup>Analyte</sup>			ifier	÷:	<b>RL</b> 0.400		<b>MDL Unit</b> .120 ug/S		P	repared	Prep Type Prep Ba	e: Tot itch: '	tal/NA
Matrix: Air Analysis Batch: 11616 Analyte Ig Lab Sample ID: LCS 140-11 Matrix: Air	Re	sult Qual	ifier	च (				ample	P 05/2	repared 25/17 09:00	Prep Type Prep Ba	e: Tot tch: d 1:28 rol Sa	tal/NA 1154: Dil Fa ample tal/NA
Matrix: Air Analysis Batch: 11616 Analyte Ig Lab Sample ID: LCS 140-11 Matrix: Air Analysis Batch: 11616	Re	sult Qual		Spike		LCS	.120 ug/S	Client	P 05/2 : <b>Sa</b> i	repared 5/17 09:00 mple ID:	Analyze O 05/26/17 11 Lab Contr Prep Type Prep Ba %Rec.	e: Tot tch: d 1:28 rol Sa	tal/NA 1154: Dil Fac ample tal/NA
Matrix: Air Analysis Batch: 11616 Analyte Ig Lab Sample ID: LCS 140-11 Matrix: Air Analysis Batch: 11616	Re	sult Qual		Spike Added		LCS Result	.120 ug/S	Client Unit	P 05/2	repared 25/17 09:00 mple ID: %Rec	Analyzee  O 5/26/17 11  Lab Contr  Prep Type  Prep Ba  %Rec. Limits	e: Tot tch: d 1:28 rol Sa	tal/NA 11543 Dil Fac ample tal/NA
Matrix: Air Analysis Batch: 11616 Analyte Ig Lab Sample ID: LCS 140-11 Matrix: Air Analysis Batch: 11616	Re	sult Qual		Spike		LCS	.120 ug/S	Client	P 05/2 : <b>Sa</b> i	repared 5/17 09:00 mple ID:	Analyze O 05/26/17 11 Lab Contr Prep Type Prep Ba %Rec.	e: Tot tch: d 1:28 rol Sa	tal/NA 1154: Dil Fac ample tal/NA
Matrix: Air Analysis Batch: 11616  Analyte  dg  Lab Sample ID: LCS 140-11  Matrix: Air  Analysis Batch: 11616  Analyte	Re	sult Qual		Spike Added		LCS Result	120 ug/S LCS Qualifier	Client Unit ug/Sample	P 05/2 Sai	repared 25/17 09:00 mple ID: %Rec 99	Analyzed 05/26/17 11 Lab Control Prep Type Prep Ba %Rec. Limits 80 - 120	d li28 rol Sa e: Tot	tal/NA 1154: Dil Fac ample tal/NA 1154:
Matrix: Air Analysis Batch: 11616  Analyte  Ig  Lab Sample ID: LCS 140-11  Matrix: Air  Analysis Batch: 11616  Analyte  Ig  Lab Sample ID: 140-8115-4	Re	sult Qual		Spike Added		LCS Result	120 ug/S LCS Qualifier	Client Unit ug/Sample	P 05/2 Sai	repared 25/17 09:00 mple ID: %Rec 99	Analyzed 05/26/17 11 Lab Continer Prep Type Prep Ba %Rec. Limits 80 - 120 Prep R1 M	d 1:28 rol Sa e: Tot tch:	tal/N/ 1154: Dil Fa ample tal/N/ 1154:
Lab Sample ID: MB 140-119 Matrix: Air Analysis Batch: 11616  Analyte  Ig Lab Sample ID: LCS 140-11 Matrix: Air Analysis Batch: 11616  Analyte  Ig Lab Sample ID: 140-8115-4 Matrix: Air Analysis Batch: 11616	Re	sult Qual		Spike Added		LCS Result	120 ug/S LCS Qualifier	Client Unit ug/Sample	P 05/2 Sai	repared 25/17 09:00 mple ID: %Rec 99	Analyzed 05/26/17 11 Lab Control Prep Type Prep Ba %Rec. Limits 80 - 120	e: Tot	tal/N/ 1154: Dil Fa ample tal/N/ 1154: H IMF
Matrix: Air Analysis Batch: 11616  Analyte  Ig  Lab Sample ID: LCS 140-11  Matrix: Air Analysis Batch: 11616  Analyte  Ig  Lab Sample ID: 140-8115-4  Matrix: Air	Re 1542/11-B MS	sult Qual		Spike Added		LCS Result	120 ug/S LCS Qualifier	Client Unit ug/Sample	P 05/2 Sai	repared 25/17 09:00 mple ID: %Rec 99	Analyzed 05/26/17 11 Lab Continer Prep Type Prep Ba %Rec. Limits 80 - 120 Prep Type Prep Type Prep Ba %Rec.	e: Tot	tal/N/ 1154: Dil Fa ample tal/N/ 1154: H IMF
Matrix: Air Analysis Batch: 11616  Analyte  Ig  Lab Sample ID: LCS 140-11  Matrix: Air Analysis Batch: 11616  Analyte  Ig  Lab Sample ID: 140-8115-4  Matrix: Air Analysis Batch: 11616  Analysis Batch: 11616	Re 1542/11-B  MS  Sample Result	esult Qual		Spike Added 10.0 Spike Added		LCS Result 9.900	LCS Qualifier  MS Qualifier	Unit ug/Sample lient Samp	P 05/2: Sal	repared 25/17 09:00 mple ID: %Rec 99	Analyzed 05/26/17 11 Lab Control Prep Type Prep Ba %Rec. Limits 80 - 120 24 F2 R1 M Prep Type Prep Ba %Rec. Limits Limits 80 - 120	e: Tot	tal/NA 1154: Dil Fac ample tal/NA 1154:
Matrix: Air Analysis Batch: 11616  Analyte  Ig  Lab Sample ID: LCS 140-11  Matrix: Air Analysis Batch: 11616  Analyte  Ig  Lab Sample ID: 140-8115-4  Matrix: Air Analysis Batch: 11616	Re 1542/11-B  MS  Sample	Sample		Spike Added 10.0		LCS Result 9.900	LCS Qualifier  MS Qualifier	Client Unit ug/Sample	P 05/2: Sal	**Rec 99	Analyzed 05/26/17 11 Lab Control Prep Type Prep Ba %Rec. Limits 80 - 120 24 F2 R1 M Prep Type Prep Ba %Rec.	e: Tot	tal/NA 1154: Dil Fac ample tal/NA 1154:
Matrix: Air Analysis Batch: 11616  Analyte  Ig  Lab Sample ID: LCS 140-11 Matrix: Air Analysis Batch: 11616  Analyte  Ig  Lab Sample ID: 140-8115-4 Matrix: Air Analysis Batch: 11616  Analyte  Ig  Lab Sample ID: 140-8115-4  Analyte  Ig  Lab Sample ID: 140-8115-4	MS Sample Result 13.7	Sample		Spike Added 10.0 Spike Added		LCS Result 9.900	LCS Qualifier  C  MS Qualifier  4	Unit ug/Sample Unit ug/Sample	P 05/2: San	**Rec 99 ** Rec 84 **	Analyzed 05/26/17 11 Lab Continue Prep Type Prep Ba %Rec. Limits 80 - 120 Prep Ba %Rec. Prep Ba %Rec. Limits 80 - 120 Prep Ba %Rec. Prep Ba %Rec. Limits 80 - 120 Prep Ba %Rec. Prep Ba %Rec. Limits 80 - 120 Prep Ba %Rec. Prep Ba %Rec. Limits 80 - 120 Prep Ba %Rec. Prep Ba %Rec. Limits 80 - 120 Prep Ba %Rec. Prep Ba %Rec. Limits 80 - 120 Prep Ba %Rec. Prep Ba %Rec. Limits 80 - 120 Prep Ba %Rec. Prep	e: Tot ttch: d 1:28 rol Sa e: Tot ttch:	tal/N/ 1154: Dil Fa ample tal/N/ 1154: H IMF
Matrix: Air Analysis Batch: 11616  Analyte  Ig  Lab Sample ID: LCS 140-11  Matrix: Air Analysis Batch: 11616  Analyte  Ig  Lab Sample ID: 140-8115-4  Matrix: Air Analysis Batch: 11616  Analyte  Ig  Lab Sample ID: 140-8115-4  Matrix: Air  Analyte  Ig  Lab Sample ID: 140-8115-4  Matrix: Air	MS Sample Result 13.7	Sample		Spike Added 10.0 Spike Added		LCS Result 9.900	LCS Qualifier  C  MS Qualifier  4	Unit ug/Sample Unit ug/Sample	P 05/2: San	**Rec 99 ** Rec 84 **	Analyzed 05/26/17 11 Lab Control Prep Type Prep Ba %Rec. Limits 80 - 120 24 F2 R1 M Prep Type Prep Ba %Rec. Limits 80 - 120	e: Tot ttch:  d 1:28  rol Sa e: Tot ttch:  29 Bi e: Tot	tal/NA 11543  Dil Fac ample tal/NA 11543  H IMF tal/NA
Matrix: Air Analysis Batch: 11616  Analyte  Ig  Lab Sample ID: LCS 140-11  Matrix: Air Analysis Batch: 11616  Analyte  Ig  Lab Sample ID: 140-8115-4  Matrix: Air	MS Sample Result 13.7	Sample Qualifier		Spike Added 10.0 Spike Added		LCS Result 9.900	LCS Qualifier  CI  MS Qualifier  4	Unit ug/Sample Unit ug/Sample	P 05/2: San	**Rec 99 ** Rec 84 **	Analyzed 05/26/17 11 Lab Continue Prep Type Prep Ba %Rec. Limits 80 - 120 Prep Ba %Rec.	e: Tot ttch:  d 1:28  rol Sa e: Tot ttch:  29 Bi e: Tot	tal/NA 11543  Dil Fac ample tal/NA 11543  H IMF tal/NA
Matrix: Air Analysis Batch: 11616  Analyte  Ig  Lab Sample ID: LCS 140-11  Matrix: Air Analysis Batch: 11616  Analyte  Ig  Lab Sample ID: 140-8115-4  Matrix: Air Analysis Batch: 11616  Analyte  Ig  Lab Sample ID: 140-8115-4  Matrix: Air  Analyte  Ig  Lab Sample ID: 140-8115-4  Matrix: Air	MS Sample Result 13.7 MSD	Sample Qualifier		Spike Added 10.0 Spike Added 2.00		LCS Result 9.900 MS Result 15.36	LCS Qualifier  C  MS Qualifier  C  MSD Qualifier	Unit ug/Sample Unit ug/Sample	P 05/2: San	**Rec 99 ** Rec 84 **	Analyzed 05/26/17 11 Lab Continer Prep Type Prep Ba %Rec. Limits 80 - 120 24 F2 R1 M Prep Type Prep Ba %Rec. Limits 80 - 120 24 F2 R1 M Prep Type Prep Ba %Rec. Limits 80 - 120	e: Tot ttch:  d 1:28  rol Sa e: Tot ttch:  29 Bi e: Tot	tal/NA 11543  Dil Fac ample tal/NA 11543  H IMF tal/NA 11543

Client: URS Corporation Project/Site: Suncoke - M5/29

TestAmerica Job ID: 140-8115-1

Lab Sample ID: MB 140-11655/9-B Client Sample ID: Method Blank Matrix: Air Prep Type: Total/NA **Analysis Batch: 11672** Prep Batch: 11655 MB MB Result Qualifier Analyte RL MDL Unit Prepared **Analyzed** Dil Fac 0.200 Hg ND 05/24/17 12:00 05/30/17 15:04 0.0800 ug/Sample Lab Sample ID: LCS 140-11655/10-B Client Sample ID: Lab Control Sample Matrix: Air Prep Type: Total/NA **Analysis Batch: 11672** Prep Batch: 11655 Spike LCS LCS %Rec. Analyte Added Result Qualifier Limits Unit D %Rec 5.00 Hg 4.810 ug/Sample 96 80 - 120 Lab Sample ID: LCSD 140-11655/11-B Client Sample ID: Lab Control Sample Dup Matrix: Air Prep Type: Total/NA **Analysis Batch: 11672** Prep Batch: 11655 LCSD LCSD Spike %Rec. **RPD** Analyte Added Result Qualifier Limits Limit Unit D %Rec RPD Hg 5.00 4.620 4 ug/Sample 92 80 - 120 20

Client: URS Corporation Project/Site: Suncoke - M5/29 TestAmerica Job ID: 140-8115-1

Matrix: Air

Matrix: Air

Client Sample ID: R-2421 F2 R1 M5 FILTER

Lab Sample ID: 140-8115-1 Date Collected: 05/08/17 00:00

Date Received: 05/16/17 13:05

Batch Batch Dil Initial Final Batch Prepared

Prep Type Type Method Run **Factor** Amount Amount Number or Analyzed Analyst Lab Total/NA 5 Analysis 11498 05/23/17 09:42 TSN TAL KNX

Instrument ID: FT\_Gross

Client Sample ID: R-2422 F2 R1 M5 ACETONE

Lab Sample ID: 140-8115-2 Date Collected: 05/08/17 00:00 Matrix: Air

Date Received: 05/16/17 13:05

Batch Batch Dil Initial Final **Batch** Prepared Prep Type Type Method Run **Factor Amount Amount** Number or Analyzed Analyst Lab Total/NA Analysis 11498 05/23/17 09:42 TSN TAL KNX

Instrument ID: FT\_Gross

Client Sample ID: R-2421,2422,2423 F2 R1 M29 FH COMP Lab Sample ID: 140-8115-3

Date Collected: 05/08/17 00:00

Date Received: 05/16/17 13:05

Batch Batch Dil Initial Final Batch Prepared Prep Type Type Method Amount Run **Factor Amount** Number or Analyzed Analyst Lab Total/NA Prep AT Prep (FH) 1 Sample 100 mL 212181 05/24/17 12:00 TAL PIT Total/NA Analysis 29/6020A 1.0 mL 5 1:0 mL 216315 07/05/17 20:14 WTR **TAL PIT** Instrument ID: M Total/NA Prep AT Prep (FH) 1 Sample 100 mL 11655 TAL KNX 05/24/17 12:00 PJB Total/NA Cleanup AT Prep FH 5 mL 50 mL 11656 05/30/17 09:00 PJB TAL KNX Total/NA Analysis 29/7470A 1 11672 05/30/17 15:12 PJB **TAL KNX** Instrument ID: HG

Client Sample ID: R-2424 F2 R1 M29 BH IMP Lab Sample ID: 140-8115-4

Date Collected: 05/08/17 00:00

Matrix: Air Date Received: 05/16/17 13:05

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	AT Prep (BH)	· //	. — —	1 Sample	100 mL	211848	05/22/17 09:22		TAL PIT
Total/NA	Analysis	29/6020A		1	1.0 mL	1.0 mL	216315	07/05/17 19:01	WTR	TAL PIT
	Instrumer	it ID: M								
Total/NA	Pre Prep	Air Train Vol.			1 Sample	100 mL	11542	05/25/17 08:00	PJB	TAL KNX
Total/NA	Prep	AT Prep (BH)			2.5 mL	50 mL	11543	05/25/17 09:00	PJB	TAL KNX
Total/NA	Analysis	29/7470A		1			11616	05/26/17 11:33	PJB	TAL KNX
	Instrumer	t ID: HG								

Client Sample ID: R-2425 F2 R1 M29 EMPTY IMP

Lab Sample ID: 140-8115-5 Date Collected: 05/08/17 00:00 Matrix: Air

Date Received: 05/16/17 13:05

Batch Batch Dil Initial Final Batch Prepared Prep Type Type Method Run **Factor Amount Amount** Number or Analyzed Analyst Lab Total/NA Pre Prep Air Train Vol. 1 Sample 11538 05/25/17 08:00 PJB TAL KNX 45 mL

> TestAmerica Knoxville 07/06/2017

Client: URS Corporation Project/Site: Suncoke - M5/29 TestAmerica Job ID: 140-8115-1

Client Sample ID: R-2425 F2 R1 M29 EMPTY IMP

Date Collected: 05/08/17 00:00

Lab Sample ID: 140-8115-5 Matrix: Air

Date Received: 05/16/17 13:05

	Batch	Batch		Đil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	AT Prep (Empty)			2.5 mL	50 mL	11539	05/25/17 09:00	PJB	TAL KNX
Total/NA	Analysis	29/7470A		1			11616	05/26/17 12:05	PJB	TAL KNX
	Instrumer	nt ID: HG								

Client Sample ID: R-2426 F2 R1 M29 KMNO4/H2SO4 IMP

Date Collected: 05/08/17 00:00

Date Received: 05/16/17 13:05

Lab Sample ID: 140-8115-6
Matrix: Air

Lab Sample ID: 140-8115-7

Lab Sample ID: 140-8115-8

Lab Sample ID: 140-8115-9

Matrix: Air

Matrix: Air

Matrix: Air

**Batch** Batch Dil Initial Final Batch Prepared Prep Type Type Method Run **Factor Amount** Amount Number or Analyzed Analyst Total/NA Pre Prep Air Train Vol. 1 Sample 400 mL 11528 05/25/17 08:00 PJB TAL KNX Total/NA Prep AT Prep (KMnO4) 25 mL 50 mL 11529 05/25/17 09:00 PJB TAL KNX Total/NA 29/7470A Analysis 11616 05/26/17 12:35 PJB TAL KNX 1 Instrument ID: HG

Client Sample ID: R-2427 F2 R1 M29 HCL RINSE

Date Collected: 05/08/17 00:00

Date Received: 05/16/17 13:05

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Pre Prep	Air Train Vol.	_ ~ ~		1 Sample	290 mL	11540	05/25/17 08:00	PJB	TAL KNX
Total/NA	Prep	AT Prep (HCI)			10 mL	50 mL	11541	05/25/17 09:00	PJB	TAL KNX
Total/NA	Analysis	29/7470A		1			11616	05/26/17 13:08	PJB	TAL KNX
	Instrumen	t ID: HG								

Client Sample ID: R-2466 F2 R2 M5 FILTER

Date Collected: 05/08/17 00:00

Date Received: 05/16/17 13:05

Date Neccive	4. 00/10/17 1	0.00								
	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	5		1		×1-	11498	05/23/17 09:42	TSN	TAL KNX
	Instrumer	nt ID: FT_Gross								

Client Sample ID: R-2467 F2 R2 M5 ACETONE

Date Collected: 05/08/17 00:00

Date Received: 05/16/17 13:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	5		1		-	11498	05/23/17 09:42	TSN	TAL KNX
	Instrumen	t ID: FT_Gross								

TestAmerica Knoxville 07/06/2017

Client: URS Corporation Project/Site: Suncoke - M5/29 TestAmerica Job ID: 140-8115-1

Client Sample ID: R-2466,2467,2468 F2 R2 M29 FH COMP

Date Collected: 05/08/17 00:00

Date Received: 05/16/17 13:05

Lab Sample ID: 140-8115-10

. Matrix: Air

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	AT Prep (FH)	_		1 Sample	100 mL	212181	05/24/17 12:00		TAL PIT
Total/NA	Analysis Instrumer	29/6020A at ID: M		5	1.0 mL	1.0 mL	216315	07/05/17 20:47	WTR	TAL PIT
Total/NA	Prep	AT Prep (FH)			1 Sample	100 mL	11655	05/24/17 12:00	PJB	TAL KNX
Total/NA	Cleanup	AT Prep FH			5 mL	50 mL	11656	05/30/17 09:00	PJB	TAL KNX
Total/NA	Analysis Instrumer	29/7470A at ID: HG		1			11672	05/30/17 15:19	PJB	TAL KNX

Client Sample ID: R-2469 F2 R2 M29 BH IMP

Date Collected: 05/08/17 00:00

Date Received: 05/16/17 13:05

Lab Sample ID: 140-8115-11 Matrix: Air

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	AT Prep (BH)			1 Sample	100 mL	211848	05/22/17 09:22		TAL PIT
Total/NA	Analysis	29/6020A		1	1.0 mL	1.0 mL	216315	07/05/17 19:18	WTR	TAL PIT
	Instrumen	it ID: M								
Total/NA	Pre Prep	Air Train Vol.			1 Sample	100 mL	11542	05/25/17 08:00	PJB	TAL KNX
Total/NA	Prep	AT Prep (BH)			2.5 mL	50 mL	11543	05/25/17 09:00	PJB	TAL KNX
Total/NA	Analysis	29/7470A		1			11616	05/26/17 11:40	PJB	TAL KNX
	Instrumen	it ID: HG								

Client Sample ID: R-2470 F2 R2 M29 EMPTY IMP

Date Collected: 05/08/17 00:00

Date Received: 05/16/17 13:05

Lab Sample ID: 140-8115-12

Matrix: Air

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Pre Prep	Air Train Vol.			1 Sample	25 mL	11538	05/25/17 08:00	PJB	TAL KNX
Total/NA	Prep	AT Prep (Empty)			2.5 mL	50 mL	11539	05/25/17 09:00	PJB	TAL KNX
Total/NA	Analysis	29/7470A		1			11616	05/26/17 12:12	PJB	TAL KNX
	Instrumen	t ID: HG								

Client Sample ID: R-2471 F2 R2 M29 KMNO4/H2SO4 IMP

Date Collected: 05/08/17 00:00

Date Received: 05/16/17 13:05

Lab Sample ID: 140-8115-13

The second	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Pre Prep	Air Train Vol.			1 Sample	380 mL	11528	05/25/17 08:00	PJB	TAL KNX
Total/NA	Prep	AT Prep (KMnO4)			25 mL	50 mL	11529	05/25/17 09:00	PJB	TAL KNX
Total/NA	Analysis	29/7470A		1			11616	05/26/17 12:43	PJB	TAL KNX
	Instrumen	it ID: HG								

Client: URS Corporation Project/Site: Suncoke - M5/29

TestAmerica Job ID: 140-8115-1

Client Sample ID: R-2472 F2 R2 M29 HCL RINSE

Date Collected: 05/08/17 00:00

Date Received: 05/16/17 13:05

Lab Sample ID: 140-8115-14

Lab Sample ID: 140-8115-15

Lab Sample ID: 140-8115-16

Matrix: Air

Matrix: Air

Matrix: Air

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Pre Prep	Air Train Vol.			1 Sample	290 mL	11540	05/25/17 08:00	PJB	TAL KNX
Total/NA	Prep	AT Prep (HCI)			10 mL	50 mL	11541	05/25/17 09:00	PJB	TAL KNX
Total/NA	Analysis	29/7470A		1			11616	05/26/17 13:15	PJB	TAL KNX
	Instrumen	it ID: HG								

Client Sample ID: R-2511 F2 R3 M5 FILTER

Date Collected: 05/09/17 00:00

Date Received: 05/16/17 13:05

Batch Batch Dil Initial Final Batch Prepared Prep Type Type Method Run **Factor Amount Amount** Number or Analyzed **Analyst** Lab Total/NA TAL KNX Analysis 11498 05/23/17 09:42 TSN Instrument ID: FT\_Gross

Client Sample ID: R-2512 F2 R3 M5 ACETONE

Date Collected: 05/09/17 00:00

Date Received: 05/16/17 13:05

Deep Tope	Batch	Batch	Dum	Dil	Initial	Final	Batch	Prepared		Lab
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	5	-	1		***	11498	05/23/17 09:42	TSN	TAL KNX
	Instrumen	t ID: FT_Gross								

Client Sample ID: R-2511,2512,2513 F2 R3 M29 FH COMP

Date Collected: 05/09/17 00:00

Date Received: 05/16/17 13:05

Lab Sample ID: 140-8115-17

Matrix: Air

Prep Type Total/NA Total/NA	Batch Type Prep Analysis Instrumer	Batch Method AT Prep (FH) 29/6020A at ID: M	Run	Dil Factor	Initial Amount 1 Sample 1.0 mL	Final Amount 100 mL 1.0 mL	Batch Number 212181 216315	Prepared or Analyzed 05/24/17 12:00 07/05/17 20:51	Analyst WTR	Lab TAL PIT TAL PIT
Total/NA	Prep	AT Prep (FH)			1 Sample	100 mL	11655	05/24/17 12:00	PJB	TAL KNX
Total/NA	Cleanup	AT Prep FH			5 mL	50 mL	11656	05/30/17 09:00	PJB	TAL KNX
Total/NA	Analysis Instrumen	29/7470A at ID: HG		1			11672	05/30/17 15:22	PJB	TAL KNX

Client Sample ID			129 BH IMP				ab Sample ID	: 140-8115-18
Date Collected: 05/0	9/17 00	:00						Matrix: Air
Date Received: 05/1	6/17 13	:05						
Ba	itch	Batch	Dil	Initial	Final	Batch	Prepared	

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	AT Prep (BH)			1 Sample	100 mL	211848	05/22/17 09:22		TAL PIT
Total/NA	Analysis	29/6020A		1	1.0 mL	1.0 mL	216315	07/05/17 19:22	WTR	TAL PIT
	Instrumer	t ID: M								
Total/NA	Pre Prep	Air Train Vol.			1 Sample	100 mL	11542	05/25/17 08:00	PJB	TAL KNX

TestAmerica Knoxville

Client: URS Corporation Project/Site: Suncoke - M5/29 TestAmerica Job ID: 140-8115-1

Client Sample ID: R-2514 F2 R3 M29 BH IMP

Date Collected: 05/09/17 00:00

Date Received: 05/16/17 13:05

Lab Sample ID: 140-8115-18

. Matrix: Air

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	AT Prep (BH)			2.5 mL	50 mL	11543	05/25/17 09:00	PJB	TAL KNX
Total/NA	Analysis	29/7470A		2			11616	05/26/17 13:45	PJB	TAL KNX
	Instrument	ID: HG								

Client Sample ID: R-2515 F2 R3 M29 EMPTY IMP

Date Collected: 05/09/17 00:00

Date Received: 05/16/17 13:05

Lab Sample ID: 140-8115-19

Matrix: Air

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Pre Prep	Air Train Vol.			1 Sample	25 mL	11538	05/25/17 08:00	PJB	TAL KNX
Total/NA	Prep	AT Prep (Empty)			2.5 mL	50 mL	11539	05/25/17 09:00	PJB	TAL KNX
Total/NA	Analysis	29/7470A		1			11616	05/26/17 12:15	PJB	TAL KNX
	Instrumen	it ID: HG								

Initial

Amount

1 Sample

25 mL

Final

Amount

380 mL

50 mL

Batch

11528

11529

11616

Number

Dil

1

**Factor** 

Run

Client Sample ID: R-2516 F2 R3 M29 KMNO4/H2SO4 IMP

Date Collected: 05/09/17 00:00

Batch

Туре

Prep

Pre Prep

Analysis

Instrument ID: HG

Date Received: 05/16/17 13:05

Prep Type

Total/NA

Total/NA

Total/NA

Lab Sample ID: 140-8115-20 Matrix: Air

 Prepared
 Analyst
 Lab

 05/25/17 08:00
 PJB
 TAL KNX

 05/25/17 09:00
 PJB
 TAL KNX

Client Sample ID: R-2517 F2 R3 M29 HCL RINSE IMP

Batch

Method

29/7470A

Air Train Vol.

AT Prep (KMnO4)

Date Collected: 05/09/17 00:00

Date Received: 05/16/17 13:05

Lab Sample ID: 140-8115-21 Matrix: Air

05/26/17 12:45 PJB

**Batch** Batch Dil Initial Final Batch Prepared Prep Type Type Method Run **Factor** Amount Amount Number or Analyzed Analyst Lab Total/NA Pre Prep Air Train Vol. 1 Sample 280 mL 11540 05/25/17 08:00 PJB TAL KNX Total/NA Prep AT Prep (HCI) 10 mL 50 mL 11541 05/25/17 09:00 PJB TAL KNX Total/NA 29/7470A Analysis 1 11616 05/26/17 13:17 PJB **TAL KNX** Instrument ID: HG

Client Sample ID: R-2535 F2 R4 M5 FILTER

Date Collected: 05/09/17 00:00

Date Received: 05/16/17 13:05

Lab Sample ID: 140-8115-26

Matrix: Air

TAL KNX

I		Batch	Batch		Dil	Initial	Final	Batch	Prepared		
	Prep Type Total/NA	Type Analysis	Method 5	Run	Factor 1	Amount	Amount	Number 11498	or Analyzed 05/23/17 09:42	Analyst TSN	Lab TAL KNX

Instrument ID: FT\_Gross

Client: URS Corporation Project/Site: Suncoke - M5/29 TestAmerica Job ID: 140-8115-1

Client Sample ID: R-2617,2618,2619 F2 QC M29 FH COMP RB

Lab Sample ID: 140-8115-51

#2

Date Collected: 05/11/17 00:00

Matrix: Air

<b>Date</b>	Received:	05/16/17	13:05

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	AT Prep (FH)			1 Sample	100 mL	212181	05/24/17 12:00		TAL PIT
Total/NA	Analysis Instrumer	29/6020A at ID: M		5	1.0 mL	1.0 mL	216315	07/05/17 21:07	WTR	TAL PIT
Total/NA	Prep	AT Prep (FH)			1 Sample	100 mL	11655	05/24/17 12:00	PJB	TAL KNX
Total/NA	Cleanup	AT Prep FH			5 mL	50 mL	11656	05/30/17 09:00	PJB	TAL KNX
Total/NA	Analysis	29/7470A		1			11672	05/30/17 15:37	PJB	TAL KNX
	Instrumen	it ID: HG								

Client Sample ID: R-2620 F2 QC M29 BH IMP RB #2

Lab Sample ID: 140-8115-52

Date Collected: 05/11/17 00:00

Matrix: Air

Date Received: 05/16/17 13:05

Prep Type Total/NA	Batch Type Prep	Batch Method AT Prep (BH)	Run	Dil Factor	Initial Amount 1 Sample	Final Amount 100 mL	Batch Number 211848	Prepared or Analyzed 05/22/17 09:22	Analyst	Lab TAL PIT
Total/NA	Analysis Instrumen	29/6020A t ID: M		1	1.0 mL	1.0 mL	216315	07/05/17 19:54	WTR	TAL PIT
Total/NA	Pre Prep	Air Train Vol.			1 Sample	100 mL	11542	05/25/17 08:00	PJB	TAL KNX
Total/NA	Prep	AT Prep (BH)			2.5 mL	50 mL	11543	05/25/17 09:00	PJB	TAL KNX
Total/NA	Analysis Instrumen	29/7470A t ID: HG		1			11616	05/26/17 11:57	PJB	TAL KNX

Client Sample ID: R-2622 F2 QC M29 KMNO4/H2SO4 IMP RB

Lab Sample ID: 140-8115-53

#2

Date Collected: 05/11/17 00:00

Date Received: 05/16/17 13:05

Matrix: Air

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Pre Prep	Air Train Vol.			1 Sample	100 mL	11528	05/25/17 08:00	PJB	TAL KNX
Total/NA	Prep	AT Prep (KMnO4)			25 mL	50 mL	11529	05/25/17 09:00	PJB	TAL KNX
Total/NA	Analysis	29/7470A		1			11616	05/26/17 13:00	PJB	TAL KNX
	Instrumen	t ID: HG								

Client Sample ID: R-2623 F2 QC M29 HCL RINSE RB #2

Lab Sample ID: 140-8115-54

Date Collected: 05/11/17 00:00

<b>Date Rece</b>	ived:	05/16/	17 1	3:05

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Pre Prep	Air Train Vol.			1 Sample	150 mL	11540	05/25/17 08:00	PJB	TAL KNX
Total/NA	Prep	AT Prep (HCI)			10 mL	50 mL	11541	05/25/17 09:00	PJB	TAL KNX
Total/NA	Analysis	29/7470A		1			11616	05/26/17 13:42	PJB	TAL KNX

Client: URS Corporation Project/Site: Suncoke - M5/29 TestAmerica Job ID: 140-8115-1

Client Sample ID: A-6252 MEDIA CHECK FILTER

Date Collected: 05/08/17 00:00

Date Received: 05/16/17 13:05

Lab Sample ID: 140-8115-55

Matrix: Air

Ргер Туре	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	AT Prep (FH)			1 Sample	100 mL	212181	05/24/17 12:00		TAL PIT
Total/NA	Analysis Instrumer	29/6020A at ID: M		5	1.0 mL	1.0 mL	216315	07/05/17 21:12	WTR	TAL PIT
Total/NA	Prep	AT Prep (FH)			1 Sample	100 mL	11655	05/24/17 12:00	PJB	TAL KNX
Total/NA	Cleanup	AT Prep FH			5 mL	50 mL	11656	05/30/17 09:00	PJB	TAL KNX
Total/NA	Analysis Instrumer	29/7470A at ID: HG		1			11672	05/30/17 15:39	PJB	TAL KNX
Total/NA	Analysis Instrumen	5 at ID: FT_Gross		1			11498	05/23/17 09:42	TSN	TAL KNX

Client Sample ID: Method Blank

Date Collected: N/A

Date Received: N/A

Lab Sample ID: MB 140-11528/10-B

Matrix: Air

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Pre Prep	Air Train Vol.			1 Sample	50 mL	11528	05/25/17 08:00	PJB	TAL KNX
Total/NA	Prep	AT Prep (KMnO4)			25 mL	50 mL	11529	05/25/17 09:00	PJB	TAL KNX
Total/NA	Analysis	29/7470A		1			11616	05/26/17 12:31	PJB	TAL KNX
	Instrumen	t ID: HG								

Client Sample ID: Method Blank

Date Collected: N/A

Date Received: N/A

Lab Sample ID: MB 140-11538/9-B

Matrix: Air

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Pre Prep	Air Train Vol.			1 Sample	50 mL	11538	05/25/17 08:00	PJB	TAL KNX
Total/NA	Prep	AT Prep (Empty)			2.5 mL	50 mL	11539	05/25/17 09:00	PJB	TAL KNX
Total/NA	Analysis Instrumen	29/7470A		1			11616	05/26/17 11:59	PJB	TAL KNX

Client Sample ID: Method Blank

Date Collected: N/A

Date Received: N/A

Lab Sample ID: MB 140-11540/10-B

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Pre Prep	Air Train Vol.	-		1 Sample	50 mL	11540	05/25/17 08:00	PJB	TAL KNX
Total/NA	Prep	AT Prep (HCI)			10 mL	50 mL	11541	05/25/17 09:00	PJB	TAL KNX
Total/NA	Analysis	29/7470A		1			11616	05/26/17 13:03	PJB	TAL KNX
	Instrumen	t ID: HG								

Client: URS Corporation Project/Site: Suncoke - M5/29 TestAmerica Job ID: 140-8115-1

Client Sample ID: Method Blank

Date Collected: N/A

Lab Sample ID: MB 140-11542/10-B

Matrix: Air

<b>Date</b>	Receive	ed: N/A

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Pre Prep	Air Train Vol.			1 Sample	100 mL	11542	05/25/17 08:00	PJB	TAL KNX
Total/NA	Prep	AT Prep (BH)			2.5 mL	50 mL	11543	05/25/17 09:00	PJB	TAL KNX
Total/NA	Analysis	29/7470A		1			11616	05/26/17 11:28	PJB	TAL KNX
	Instrument	ID: HG								

Client Sample ID: Method Blank

Date Collected: N/A

Lab Sample ID: MB 140-11655/9-B

Matrix: Air

Date Received: N/A

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	AT Prep (FH)	_		1 Sample	100 mL	11655	05/24/17 12:00	PJB	TAL KNX
Total/NA	Cleanup	AT Prep FH			5 mL	50 mL	11656	05/30/17 09:00	PJB	TAL KNX
Total/NA	Analysis	29/7470A		1			11672	05/30/17 15:04	PJB	TAL KNX
	Instrumer	nt ID: HG								

Client Sample ID: Method Blank

Date Collected: N/A

Lab Sample ID: MB 180-211848/8-A

Matrix: Air

Date Received: N/A

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	AT Prep (BH)			1 Sample	100 mL	211848	05/22/17 09:22		TAL PIT
Total/NA	Analysis	29/6020A		1	1.0 mL	1.0 mL	216315	07/05/17 18:41	WTR	TAL PIT
	Instrumer	nt ID: M								

Client Sample ID: Method Blank

Date Collected: N/A

Date Received: N/A

Lab	Samp	le ID	: MB	180-2	1218 <sup>-</sup>	1/9-A	^5

Matrix: Air

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	AT Prep (FH)			1 Sample	100 mL	212181	05/24/17 12:00	-	TAL PIT
Total/NA	Analysis	29/6020A		5	1.0 mL	1.0 mL	216315	07/05/17 20:02	WTR	TAL PIT
	Instrumer	nt ID: M								

Client Sample ID: Lab Control Sample

Date Collected: N/A

Date Received: N/A

l ah S	Sample	ID:	ICS	140-	1452	2/1	1_P
Lab	allibic	IV.	LUG	140-	IIJZ	.0/ 1	

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Pre Prep	Air Train Vol.	7 =		1 Sample	50 mL	11528	05/25/17 08:00	PJB	TAL KNX
Total/NA	Prep	AT Prep (KMnO4)			25 mL	50 mL	11529	05/25/17 09:00	PJB	TAL KNX
Total/NA	Analysis	29/7470A		1			11616	05/26/17 12:33	PJB	TAL KNX
	Instrumen	t ID: HG								

Client: URS Corporation Project/Site: Suncoke - M5/29 TestAmerica Job ID: 140-8115-1

Client Sample ID: Lab Control Sample

Date Collected: N/A Date Received: N/A

Lab Sample ID: LCS 140-11538/10-B

Matrix: Air

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Pre Prep	Air Train Vol.			1 Sample	50 mL	11538	05/25/17 08:00	PJB	TAL KNX
Total/NA	Prep	AT Prep (Empty)			2.5 mL	50 mL	11539	05/25/17 09:00	PJB	TAL KNX
Total/NA	Analysis	29/7470A		1			11616	05/26/17 12:02	PJB	TAL KNX
	Instrumen	t ID: HG								

Client Sample ID: Lab Control Sample

Date Collected: N/A

Date Received: N/A

Lab Sample ID: LCS 140-11540/11-B

Matrix: Air

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Pre Prep	Air Train Vol.		-	1 Sample	50 mL	11540	05/25/17 08:00	PJB	TAL KNX
Total/NA	Prep	AT Prep (HCI)			10 mL	50 mL	11541	05/25/17 09:00	PJB	TAL KNX
Total/NA	Analysis	29/7470A		1			11616	05/26/17 13:05	PJB	TAL KNX
	Instrumen	t ID: HG								

Client Sample ID: Lab Control Sample

Date Collected: N/A

Date Received: N/A

Lab Sample ID: LCS 140-11542/11-B

Matrix: Air

		Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep	Туре	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/	NA	Pre Prep	Air Train Vol.			1 Sample	100 mL	11542	05/25/17 08:00	PJB	TAL KNX
Total/	NA	Prep	AT Prep (BH)			2.5 mL	50 mL	11543	05/25/17 09:00	PJB	TAL KNX
Total/	NA	Analysis	29/7470A		-1			11616	05/26/17 11:30	PJB	TAL KNX
		Instrument	ID: HG								

Client Sample ID: Lab Control Sample

Date Collected: N/A

Date Received: N/A

Lab Sample ID: LCS 140-11655/10-B

Matrix: Air

Matrix: Air

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Ргер Туре	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	AT Prep (FH)			1 Sample	100 mL	11655	05/24/17 12:00	PJB	TAL KNX
Total/NA	Cleanup	AT Prep FH			5 mL	50 mL	11656	05/30/17 09:00	PJB	TAL KNX
Total/NA	Analysis	29/7470A		1			11672	05/30/17 15:07	PJB	TAL KNX
	Instrumer	nt ID: HG								

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 180-211848/9-A Date Collected: N/A Date Received: N/A

Bran Tuna	Batch	Batch Method	Dun	Dil	Initiai	Final	Batch	Prepared	A bun4	Lab
Prep Type Total/NA	Type Prep	AT Prep (BH)	Run	Factor	1 Sample	Amount 100 mL	Number 211848	or Analyzed 05/22/17 09:22	Analyst	Lab TAL PIT
Total/NA	Analysis	29/6020A		1	1.0 mL	1.0 mL	216315	07/05/17 18:49	WTR	TAL PIT
	Instrumen	t ID· M								

Client: URS Corporation Project/Site: Suncoke - M5/29 TestAmerica Job ID: 140-8115-1

Client Sample ID: Lab Control Sample

Date Collected: N/A

Date Received: N/A

Lab Sample ID: LCS 180-212181/10-A ^5

Matrix: Air

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	AT Prep (FH)	=:-		1 Sample	100 mL	212181	05/24/17 12:00		TAL PIT
Total/NA	Analysis	29/6020A		5	1.0 mL	1.0 mL	216315	07/05/17 20:06	WTR	TAL PIT
	Instrumer	nt ID: M								

Client Sample ID: Lab Control Sample Dup

Date Collected: N/A

Date Received: N/A

Lab Sample ID: LCSD 140-11655/11-B

Matrix: Air

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	AT Prep (FH)	-		1 Sample	100 mL	11655	05/24/17 12:00	PJB	TAL KNX
Total/NA	Cleanup	AT Prep FH			5 mL	50 mL	11656	05/30/17 09:00	PJB	TAL KNX
Total/NA	Analysis	29/7470A		1			11672	05/30/17 15:09	PJB	TAL KNX
	Instrumer	nt ID: HG								

Client Sample ID: Lab Control Sample Dup

Date Collected: N/A

Date Received: N/A

Lab Sample ID: LCSD 180-211848/10-A

Matrix: Air

	Batch -	Batch	_	Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	AT Prep (BH)			1 Sample	100 mL	211848	05/22/17 09:22		TAL PIT
Total/NA	Analysis	29/6020A		1	1.0 mL	1,0 mL	216315	07/05/17 18:57	WTR	TAL PIT
	Instrumer	it ID: M								

Client Sample ID: Lab Control Sample Dup

Date Collected: N/A

Date Received: N/A

Lab Sample ID: LCSD 180-212181/11-A ^5

Matrix: Air

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	AT Prep (FH)	_		1 Sample	100 mL	212181	05/24/17 12:00		TAL PIT
Total/NA	Analysis	29/6020A		5	1.0 mL	1.0 mL	216315	07/05/17 20:10	WTR	TAL PIT
	Instrumer	nt ID: M								

Client Sample ID: R-2424 F2 R1 M29 BH IMP

Date Collected: 05/08/17 00:00

Date Received: 05/16/17 13:05

Lab	Sample	ID:	140-8115-4 MS

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Pre Prep	Air Train Vol.			1 Sample	100 mL	11542	05/25/17 08:00	PJB	TAL KNX
Total/NA	Prep	AT Prep (BH)			2.5 mL	50 mL	11543	05/25/17 09:00	PJB	TAL KNX
Total/NA	Analysis	29/7470A		1			11616	05/26/17 11:35	PJB	TAL KNX
	Instrumen	t ID: HG								

Client: URS Corporation Project/Site: Suncoke - M5/29 TestAmerica Job ID: 140-8115-1

Client Sample ID: R-2424 F2 R1 M29 BH IMP

Date Collected: 05/08/17 00:00

Date Received: 05/16/17 13:05

Lab Sample ID: 140-8115-4 MSD

.ab Sample ID. 140-6115-4 WSD Matrix: Air

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Pre Prep	Air Train Vol.			1 Sample	100 mL	11542	05/25/17 08:00	PJB	TAL KNX
Total/NA	Prep	AT Prep (BH)			2.5 mL	50 mL	11543	05/25/17 09:00	PJB	TAL KNX
Total/NA	Analysis	29/7470A		1			11616	05/26/17 11:37	PJB	TAL KNX
	Instrument	ID: HG								

Client Sample ID: R-2425 F2 R1 M29 EMPTY IMP

Date Collected: 05/08/17 00:00

Date Received: 05/16/17 13:05

Lab Sample ID: 140-8115-5 MS

Matrix: Air

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Pre Prep	Air Train Vol.		-	1 Sample	45 mL	11538	05/25/17 08:00	PJB	TAL KNX
Total/NA	Prep	AT Prep (Empty)			2.5 mL	50 mL	11539	05/25/17 09:00	PJB	TAL KNX
Total/NA	Analysis	29/7470A		1			11616	05/26/17 12:07	PJB	TAL KNX
	Instrumen	t ID: HG								

Client Sample ID: R-2425 F2 R1 M29 EMPTY IMP

Date Collected: 05/08/17 00:00

Date Received: 05/16/17 13:05

Lab Sample ID: 140-8115-5 MSD

Lab Sample ID: 140-8115-6 MS

Matrix: Air

Matrix: Air

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Pre Prep	Air Train Vol.			1 Sample	45 mL	11538	05/25/17 08:00	PJB	TAL KNX
Total/NA	Prep	AT Prep (Empty)			2.5 mL	50 mL	11539	05/25/17 09:00	PJB	TAL KNX
Total/NA	Analysis	29/7470A		1			11616	05/26/17 12:10	PJB	TAL KNX
	Instrumen	t ID: HG								

Client Sample ID: R-2426 F2 R1 M29 KMNO4/H2SO4 IMP

Date Collected: 05/08/17 00:00

Date Received: 05/16/17 13:05

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Pre Prep	Air Train Vol.			1 Sample	400 mL	11528	05/25/17 08:00	PJB	TAL KNX
Total/NA	Prep	AT Prep (KMnO4)			25 mL	50 mL	11529	05/25/17 09:00	PJB	TAL KNX
Total/NA	Analysis	29/7470A		- 1			11616	05/26/17 12:38	PJB	TAL KNX

Client Sample ID: R-2426 F2 R1 M29 KMNO4/H2SO4 IMP

Date Collected: 05/08/17 00:00

Date Received: 05/16/17 13:05

Lab	Sample	ID:	140-81	1	5-	6	MS	D
								_

Matrix: Air

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Pre Prep	Air Train Vol.			1 Sample	400 mL	11528	05/25/17 08:00	PJB	TAL KNX
Total/NA	Prep	AT Prep (KMnO4)			25 mL	50 mL	11529	05/25/17 09:00	PJB	TAL KNX
Total/NA	Analysis	29/7470A		1			11616	05/26/17 12:40	PJB	TAL KNX
	Instrumen	t ID: HG								

TestAmerica Knoxville

Client: URS Corporation Project/Site: Suncoke - M5/29 TestAmerica Job ID: 140-8115-1

Client Sample ID: R-2427 F2 R1 M29 HCL RINSE

Date Collected: 05/08/17 00:00

Lab Sample ID: 140-8115-7 MS

Lab Sample ID: 140-8115-7 MSD

Matrix: Air

Matrix: Air

Date Received: 05/16/17 13:	05
-----------------------------	----

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Pre Prep	Air Train Vol.			1 Sample	290 mL	11540	05/25/17 08:00	PJB	TAL KNX
Total/NA	Prep	AT Prep (HCI)			10 mL	50 mL	11541	05/25/17 09:00	PJB	TAL KNX
Total/NA	Analysis Instrumen	29/7470A at ID: HG		1			11616	05/26/17 13:10	PJB	TAL KNX

Client Sample ID: R-2427 F2 R1 M29 HCL RINSE

Date Collected: 05/08/17 00:00 Date Received: 05/16/17 13:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Pre Prep	Air Train Vol.			1 Sample	290 mL	11540	05/25/17 08:00	PJB	TAL KNX
Total/NA	Prep	AT Prep (HCI)			10 mL	50 mL	11541	05/25/17 09:00	PJB	TAL KNX
Total/NA	Analysis	29/7470A		1			11616	05/26/17 13:13	PJB	TAL KNX
	Instrumen	t ID: HG								

Laboratory References:

TAL KNX = TestAmerica Knoxville, 5815 Middlebrook Pike, Knoxville, TN 37921, TEL (865)291-3000 TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

# **Accreditation/Certification Summary**

Client: URS Corporation Project/Site: Suncoke - M5/29

TestAmerica Job ID: 140-8115-1

# Laboratory: TestAmerica Knoxville

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
	AFCEE		N/A	<del>-</del> 1/
ANAB	DoD ELAP		L2311	02-13-19
Arkansas DEQ	State Program	6	88-0688	06-16-18
California	State Program	9	2423	06-30-18
Colorado	State Program	8	TN00009	02-28-18
Connecticut	State Program	1	PH-0223	09-30-17
Florida	NELAP	4	E87177	06-30-18
Georgia	State Program	4	906	04-13-20
Hawaii	State Program	9	N/A	04-13-18
Kansas	NELAP	7	E-10349	10-31-17
Kentucky (DW)	State Program	4	90101	12-31-17
Louisiana	NELAP	6	83979	06-30-18
Louisiana (DW)	NELAP	6	LA160005	12-31-17
Maryland	State Program	3	277	03-31-18
Michigan	State Program	5	9933	04-13-20
Nevada	State Program	9	TN00009	07-31-17
New Jersey	NELAP	2	TN001	06-30-18
New York	NELAP	2	10781	03-31-18
North Carolina (DW)	State Program	4	21705	07-31-17
North Carolina (WW/SW)	State Program	4	64	12-31-17
Ohio VAP	State Program	5	CL0059	11-22-18
Oklahoma	State Program	6	9415	08-31-17
Pennsylvania	NELAP	3	68-00576	12-31-17
Tennessee	State Program	4	2014	04-13-20
Texas	NELAP	6	T104704380-16-9	08-31-17
USDA	Federal		P330-13-00262	08-20-19
Utah	NELAP	8	TN00009	07-31-17
Virginia	NELAP	3	460176	09-14-17
Washington	State Program	10	C593	01-19-18
West Virginia (DW)	State Program	3	9955C	12-31-17
West Virginia DEP	State Program	3	345	04-30-18
Wisconsin	State Program	5	998044300	08-31-17

# Laboratory: TestAmerica Pittsburgh

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	<b>Expiration Date</b>
Arkansas DEQ	State Program	6	88-0690	06-27-18
California	State Program	9	2891	03-31-18
Connecticut	State Program	1	PH-0688	09-30-18
Florida	NELAP	4	E871008	06-30-18
Illinois	NELAP	5	200005	06-30-18
Kansas	NELAP	7	E-10350	01-31-18
Louisiana	NELAP	6	04041	06-30-18
New Hampshire	NELAP	1	2030	04-04-18
New Jersey	NELAP	2	PA005	06-30-18
New York	NELAP	2	11182	03-31-18
North Carolina (WW/SW)	State Program	4	434	12-31-17
Pennsylvania	NELAP	3	02-00416	04-30-18
South Carolina	State Program	4	89014	04-30-18

# **Accreditation/Certification Summary**

Client: URS Corporation Project/Site: Suncoke - M5/29 TestAmerica Job ID: 140-8115-1

Laboratory: TestAmerica Pittsburgh (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	<b>Expiration Date</b>
Texas	NELAP	6	T104704528-15-2	03-31-18
US Fish & Wildlife	Federal		LE94312A-1	10-31-17
USDA	Federal		P330-16-00211	06-26-19
Utah	NELAP	8	PA001462015-4	05-31-18
Virginia	NELAP	3	460189	09-14-17
West Virginia DEP	State Program	3	142	01-31-18
Wisconsin	State Program	5	998027800	08-31-17



# **ANALYTICAL REPORT**

Job Number: 140-8107-1

Job Description: Suncoke Coke ICR - M26A

For:

URS Corporation 105 Mitchell Road, Suite 200 Oak Ridge, TN 37830

Attention: John Carson

Sowmenf Ackenis

Approved for release Courtney M Adkins Project Manager I 5/30/2017 10:42 AM

Courtney M Adkins, Project Manager I 5815 Middlebrook Pike, Knoxville, TN, 37921 (865)291-3000 courtney.adkins@testamericainc.com 05/30/2017

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# **Definitions/Glossary**

Client: URS Corporation

Project/Site: Suncoke Coke ICR - M26A

TestAmerica Job ID: 140-8107-1

# Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
n	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

05/30/2017

# **Method Summary**

Client: URS Corporation

Project/Site: Suncoke Coke ICR - M26A

TestAmerica Job ID: 140-8107-1

Method	Method Description	Protocol	Laboratory
0050/26A	Hydrogen Halide and Halogen Emissions/Stationary Sources (Mod)	SW846	TAL KNX

### **Protocol References:**

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

### **Laboratory References:**

TAL KNX = TestAmerica Knoxville, 5815 Middlebrook Pike, Knoxville, TN 37921, TEL (865)291-3000

# **Sample Summary**

Client: URS Corporation Project/Site: Suncoke Coke ICR - M26A

TestAmerica Job ID: 140-8107-1

Lab Sample ID	Client Sample ID	Matrix	Collected Received
140-8107-1	R-2430 R1 M26A IMPINGER	Air	05/05/17 00:00 05/16/17 13:05
140-8107-2	R-2475 R2 M26A IMPINGER	Air	05/05/17 00:00 05/16/17 13:05
140-8107-3	R-2520 R3 M26A IMPINGER	Air	05/06/17 00:00 05/16/17 13:05
140-8107-4	R-2592 QC M26A IMPINGER	Air	05/06/17 00:00 05/16/17 13:05

# Job Narrative 140-8107-1

#### Sample Receipt

The samples were received on May 16, 2017 at 1:05 PM. The samples arrived in good condition and properly preserved. The temperature of the cooler at receipt was 22.0° C.

## **Quality Control and Data Interpretation**

Unless otherwise noted, all holding times, and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

## **General Chemistry**

Analysis of Stationary Source Emission Samples by Ion Chromatography: Samples were analyzed for chloride and fluoride by ion chromatography using SOP number KNOX-WC-005 (based on EPA methods 9056, 9057 and 26A). Results for the sulfuric acid impinger samples were reported as total µg hydrogen chloride and total µg hydrogen fluoride.

Results were calculated using the following equations:

Hydrogen Fluoride, µg = (Fluoride, µg/mL) × (Sample Volume, mL) × (Molecular Weight HF / Molecular Weight F) × Bench DF

Hydrogen Chloride, µg = (Chloride, µg/mL) × (Sample Volume, mL) × (Molecular Weight HCl / Molecular Weight Cl) × Bench DF

Note: A sample volume of 100 mL was used to convert the results to total µg for the method blanks, laboratory control samples, and client reagent blanks.

For demonstration of analytical method performance on these samples, TestAmerica Knoxville analyzed matrix spikes (MS) and matrix spike duplicates (MSD). Acceptable recoveries of these spikes demonstrate that quantitation from this particular stack gas matrix is accurate and acceptable. Impinger samples containing 0.1N sulfuric acid and 0.1N sodium hydroxide often display matrix interference effects causing poor method performance and possibly giving unreliable data unless the interference is dealt with. Therefore, the samples were diluted in the lab to reduce the interference for a more accurate anion response. The samples may be analyzed at increasing dilutions along with matrix spikes until matrix spikes display acceptable recoveries.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

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# **QC Association Summary**

Client: URS Corporation Project/Site: Suncoke Coke ICR - M26A

TestAmerica Job ID: 140-8107-1

# HPLC/IC

# Prep Batch: 11522

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-8107-1	R-2430 R1 M26A IMPINGER	Total/NA	Air	0050/26A	* *************************************
140-8107-2	R-2475 R2 M26A IMPINGER	Total/NA	Air	0050/26A	
140-8107-3	R-2520 R3 M26A IMPINGER	Total/NA	Air	0050/26A	
140-8107-4	R-2592 QC M26A IMPINGER	Total/NA	Air	0050/26A	
MB 140-11522/3-A	Method Blank	Total/NA	Air	0050/26A	
LCS 140-11522/1-A	Lab Control Sample	Total/NA	Air	0050/26A	
LCSD 140-11522/2-A	Lab Control Sample Dup	Total/NA	Air	0050/26A	
140-8107-1 MS	R-2430 R1 M26A IMPINGER	Total/NA	Air	0050/26A	
140-8107-1 MSD	R-2430 R1 M26A IMPINGER	Total/NA	Air	0050/26A	

# **Analysis Batch: 11556**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-8107-1	R-2430 R1 M26A IMPINGER	Total/NA	Air	0050/26A	11522
140-8107-1	R-2430 R1 M26A IMPINGER	Total/NA	Air	0050/26A	11522
140-8107-2	R-2475 R2 M26A IMPINGER	Total/NA	Air	0050/26A	11522
140-8107-2	R-2475 R2 M26A IMPINGER	Total/NA	Air	0050/26A	11522
140-8107-3	R-2520 R3 M26A IMPINGER	Total/NA	Air	0050/26A	11522
140-8107-3	R-2520 R3 M26A IMPINGER	Total/NA	Air	0050/26A	11522
140-8107-4	R-2592 QC M26A IMPINGER	Total/NA	Аіг	0050/26A	11522
MB 140-11522/3-A	Method Blank	Total/NA	Аіг	0050/26A	11522
LCS 140-11522/1-A	Lab Control Sample	Total/NA	Air	0050/26A	11522
LCSD 140-11522/2-A	Lab Control Sample Dup	Total/NA	Air	0050/26A	11522
140-8107-1 MS	R-2430 R1 M26A IMPINGER	Total/NA	Air	0050/26A	11522
140-8107-1 MS	R-2430 R1 M26A IMPINGER	Total/NA	Air	0050/26A	11522
140-8107-1 MSD	R-2430 R1 M26A IMPINGER	Total/NA	Air	0050/26A	11522
140-8107-1 MSD	R-2430 R1 M26A IMPINGER	Total/NA	Air	0050/26A	11522

# Client Sample Results

Client: URS Corporation

Project/Site: Suncoke Coke ICR - M26A

TestAmerica Job ID: 140-8107-1

05/24/17 08:06 05/24/17 13:15

Dil Fac

Matrix: Air

Matrix: Air

500

Client Sample ID: R-2430 R1 M26A IMPINGER Lab Sample ID: 140-8107-1 Matrix: Air

Date Collected: 05/05/17 00:00

Date Received: 05/16/17 13:05

Sample Container: Plastic 1 liter - unpreserved

Method: 0050/26A - Hydrogen Halide and Halogen Emissions/Stationary Sources (Mod)

Analyte	Result	Qualifier	RL	MDL		D	Prepared	Analyzed	Dil Fac
Hydrogen Chloride	166000		48300	20300	ug/Sample		05/24/17 08:06	05/24/17 10:49	1000
Hydrogen Fluoride	4310		990	495	ug/Sample		05/24/17 08:06	05/24/17 10:31	20

Client Sample ID: R-2475 R2 M26A IMPINGER

Date Collected: 05/05/17 00:00 Date Received: 05/16/17 13:05

Sample Container: Plastic 1 liter - unpreserved

Lab Sample ID: 140-8107-2 Matrix: Air

Method: 0050/26A - Hydrogen Halide and Halogen Emissions/Stationary Sources (Mod) Analyte Result Qualifier RL MDL Unit Prepared Analyzed 24900 Hydrogen Chloride 156000 10500 ug/Sample 05/24/17 08:06 05/24/17 13:33

Client Sample ID: R-2520 R3 M26A IMPINGER Lab Sample ID: 140-8107-3

255

128 ug/Sample

Date Collected: 05/06/17 00:00 Date Received: 05/16/17 13:05

Hydrogen Fluoride

Sample Container: Plastic 1 liter - unpreserved

Method: 0050/26A - Hydrogen Halide and Halogen Emissions/Stationary Sources (Mod)

3260

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hydrogen Chloride	187000		13100	5510	ug/Sample		05/24/17 08:06	05/24/17 14:31	250
Hydrogen Fluoride	4620		269	134	ug/Sample		05/24/17 08:06	05/24/17 14:13	5

Client Sample ID: R-2592 QC M26A IMPINGER Lab Sample ID: 140-8107-4

Date Collected: 05/06/17 00:00 Date Received: 05/16/17 13:05

Sample Container: Plastic 1 liter - unpreserved

Method: 0050/26A - Hydrogen Halide and Halogen Emissions/Stationary Sources (Mod)

	modica. occorzon ilyarogen il	ando and	i idiogon L		.vu.y	Courses (	1410	4)		
	Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Hydrogen Chloride	ND		20.6	8.64	ug/Sample	_	05/24/17 08:06	05/24/17 14:48	2
Ì	Hydrogen Fluoride	ND		21.1	10.5	ug/Sample		05/24/17 08:06	05/24/17 14:48	2

# **Default Detection Limits**

Client: URS Corporation

Project/Site: Suncoke Coke ICR - M26A

TestAmerica Job ID: 140-8107-1

# Method: 0050/26A - Hydrogen Halide and Halogen Emissions/Stationary Sources (Mod)

Prep: 0050/26A

Analyte	RL	MDL	Units	Method	
Hydrogen Chloride	10.3	4.32	ug/Sample	0050/26A	
Hydrogen Fluoride	10.5	5.27	ug/Sample	0050/26A	

# **QC Sample Results**

**Analyte** 

Hydrogen Chloride

Project/Site: Suncoke Coke ICR - M26A

Client: URS Corporation TestAmerica Job ID: 140-8107-1

Lab Sample ID: MB 140-115	522/3-A								Clie	ent Samı	ole ID: M	ethod	Blank
Matrix: Air											<b>Prep Ty</b>	pe: To	tal/NA
Analysis Batch: 11556											Prep E	Batch:	11522
		мв мв											
Analyte	Re	sult Qualifi	er	RL		MDL		D		repared	Analy		Dil Fac
Hydrogen Chloride		ND		10.3		4.32	_	-	05/2	4/17 08:06	05/24/17	09:55	1
Hydrogen Fluoride		ND		10.5		5.27	ug/Sa	ımple	05/2	4/17 08:06	05/24/17	09:55	1
Lab Sample ID: LCS 140-11	522/1-A							Client	Sai	mple ID:	Lab Cor	ntrol S	ample
Matrix: Air											Prep Ty	pe: To	tal/NA
Analysis Batch: 11556											Prep E	Batch:	11522
			Spike		LCS	LCS					%Rec.		
Analyte			Added	F	Result	Quali	ifier	Unit	D	%Rec	Limits		
Hydrogen Chloride			77.1		85.03			ug/Sample	-	110	90 - 110		
Hydrogen Fluoride			79.0		85.34			ug/Sample		108	90 - 110		
Lab Sample ID: LCSD 140-	11522/2-A						C	lient Sam	ple	ID: Lab	Control	Sampl	le Dup
Matrix: Air											Prep Ty	pe: To	tal/NA
Analysis Batch: 11556											Prep E	Batch:	11522
			Spike		LCSD	LCSE	)				%Rec.		RPD
Analyte			Added	F	Result	Quali	ifier	Unit	D	%Rec	Limits	RPD	Limit
Hydrogen Chloride			77.1		83.41			ug/Sample		108	90 - 110	2	20
Hydrogen Fluoride			79.0		84.99			ug/Sample		108	90 - 110	0	20
Lab Sample ID: 140-8107-1	MS						Clie	nt Sample	D:	: R-2430	R1 M26	A IMPI	NGER
Matrix: Air								•			Ргер Ту	pe: To	tal/NA
Analysis Batch: 11556											Prep E		
-	Sample	Sample	Spike		MS	MS					%Rec.		
Analyte	Result	Qualifier	Added	F	Result	Quali	ifier	Unit	D	%Rec	Limits		
Hydrogen Fluoride	4310		9910		14730			ug/Sample		105	75 - 125		
Lab Sample ID: 140-8107-1	MS						Clie	nt Sample	ID:	R-2430	R1 M26/	A IMPI	NGER
Matrix: Air								•			Prep Ty	pe: To	tal/NA
Analysis Batch: 11556											Prep E		
-	Sample	Sample	Spike		MS	MS					%Rec.		
Analyte	Result	Qualifier	Added	F	Result	Quali	fier	Unit	D	%Rec	Limits		
Hydrogen Chloride	166000		483000	6	59500			ug/Sample	=	102	75 - 125		-
Lab Sample ID: 140-8107-1	MSD						Clie	nt Sample	ID:	R-2430	R1 M26	A IMPI	NGER
Matrix: Air											Prep Ty		
Analysis Batch: 11556											Prep E	•	
, 0.0 24.0 1.000	Sample	Sample	Spike		MSD	MSD					%Rec.	Jucoii.	RPD
Analyte	-	Qualifier	Added	F		Quali	fier	Unit	D	%Rec	Limits	RPD	Limit
Hydrogen Fluoride	4310	-	9910		14560			ug/Sample	-	103	75 - 125	1	20
ah Campia ID: 440 0407 4	MCD						CI:	n4 Cama-1-	JID.	D 0400	D4 1400	A IRANII	NOCE
Lab Sample ID: 140-8107-1	MISD					,	Cile	nt Sample	: יטו				
Matrix: Air											Prep Ty		
Analysis Batch: 11556											Prep E	satch:	11522
maryone Battern 11000	Sample	Commis	Spike		MOD	MSD					%Rec.		RPD

D %Rec

103

ug/Sample

Limits

75 - 125

664700

Result Qualifier Unit

Added

483000

166000

Result Qualifier

Limit

Client: URS Corporation

Project/Site: Suncoke Coke ICR - M26A

TestAmerica Job ID: 140-8107-1

Client Sample ID: R-2430 R1 M26A IMPINGER Lab

Date Collected: 05/05/17 00:00 Date Received: 05/16/17 13:05 Lab Sample ID: 140-8107-1

Matrix: Air

Prep Type Total/NA	Batch Type Prep	Batch Method 0050/26A	Run	Dil Factor	Initial Amount 1 Sample	Final Amount 470 mL	Batch Number 11522	Prepared or Analyzed 05/24/17 08:06	Analyst	Lab TAL KNX
Total/NA	Analysis Instrumen	0050/26A		20	10 mL	10 mL	11556	05/24/17 10:31		TAL KNX
Total/NA Total/NA	Prep Analysis Instrumen	0050/26A 0050/26A at ID: 1500		1000	1 Sample 10 mL	470 mL 10 mL	11522 11556	05/24/17 08:06 05/24/17 10:49		TAL KNX TAL KNX

Client Sample ID: R-2475 R2 M26A IMPINGER

Date Collected: 05/05/17 00:00

Date Received: 05/16/17 13:05

Lab Sample ID: 140-8107-2 Matrix: Air

Instru	ment ID: 1500	5	10 mL	10 mL	11556	05/24/17 13:15	JMH	TAL KNX
Total/NA Prep Total/NA Analys	0050/26A s 0050/26A	500	1 Sample 10 mL	485 mL 10 mL	11522 11556	05/24/17 08:06 05/24/17 13:33		TAL KNX TAL KNX

Client Sample ID: R-2520 R3 M26A IMPINGER

Date Collected: 05/06/17 00:00

Date Received: 05/16/17 13:05

Lab Sample ID: 140-8107-3

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	0050/26A			1 Sample	510 mL	11522	05/24/17 08:06	JMH	TAL KNX
Total/NA	Analysis Instrumen	0050/26A at ID: 1500		5	10 mL	10 mL	11556	05/24/17 14:13	JMH	TAL KNX
Total/NA	Prep	0050/26A			1 Sample	510 mL	11522	05/24/17 08:06	JMH	TAL KNX
Total/NA	Analysis	0050/26A		250	10 mL	10 mL	11556	05/24/17 14:31	JMH	TAL KNX
	Instrumen	t ID: 1500								

Client Sample ID: R-2592 QC M26A IMPINGER

Date Collected: 05/06/17 00:00

Date Received: 05/16/17 13:05

Lab Sample ID: 140-8107-4

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	0050/26A			1 Sample	100 mL	11522	05/24/17 08:06	JMH	TAL KNX
Total/NA	Analysis	0050/26A		2	10 mL	10 mL	11556	05/24/17 14:48	JMH	TAL KNX
	Instrumer	nt ID: 1500								

Client: URS Corporation

Project/Site: Suncoke Coke ICR - M26A

TestAmerica Job ID: 140-8107-1

Client Sample ID: Method Blank Lab Sample ID: MB 140-11522/3-A

Date Collected: N/A

Date Received: N/A

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	0050/26A			1 Sample	100 mL	11522	05/24/17 08:06	JMH	TAL KNX
Total/NA	Analysis Instrumer	0050/26A nt ID: 1500		1	10 mL	10 mL	11556	05/24/17 09:55	JMH	TAL KNX

Client Sample ID: Lab Control Sample Lab Sample ID: LCS 140-11522/1-A

Date Collected: N/A

Date Received: N/A

Matrix: Air

Matrix: Air

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	0050/26A			1 Sample	100 mL	11522	05/24/17 08:06	JMH	TAL KNX
Total/NA	Analysis	0050/26A		1	10 mL	10 mL	11556	05/24/17 09:20	JMH	TAL KNX
	Instrumen	nt ID: 1500								

10 mL

Client Sample ID: Lab Control Sample Dup Lab Sample ID: LCSD 140-11522/2-A

Dil

**Factor** 

Run

Date Collected: N/A

Prep Type

Total/NA

Total/NA

Date Received: N/A

Initial	Final	Batch	Prepared		
Amount	Amount	Number	or Analyzed	Analyst	Lab
1 Sample	100 mL	11522	05/24/17 08:06	JMH	TAL KNX

10 mL

11556

Instrument ID: 1500

Batch

Method

0050/26A

0050/26A

Client Sample ID: R-2430 R1 M26A IMPINGER

Date Collected: 05/05/17 00:00

Batch

Type

Prep

Analysis

Date Received: 05/16/17 13:05

Lab	Sample	ID: 140-8	107-1	MS

05/24/17 09:37 JMH

Matrix: Air

TAL KNX

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	0050/26A			1 Sample	470 mL	11522	05/24/17 08:06	JMH	TAL KNX
Total/NA	Analysis Instrumer	0050/26A nt ID: 1500		20	10 mL	10 mL	11556	05/24/17 11:06	JMH	TAL KNX
Total/NA	Prep	0050/26A			1 Sample	470 mL	11522	05/24/17 08:06	JMH	TAL KNX
Total/NA	Analysis	0050/26A		1000	10 mL	10 mL	11556	05/24/17 11:41	JMH	TAL KNX
	Instrumen	nt ID: 1500								

Lab Cample ID: 440 0407 4 MCD Client Sample ID: R-2430 R1 M26A IMPINGER

Date Collected: 05/05/17 00:00

Date Received: 05/16/17 13:05

Lab Sample ID:	140-0107-119130
	Matrix: Air

Prep Type Total/NA Total/NA	Type Prep Analysis	Batch Method 0050/26A 0050/26A	Run	Factor 20	Amount 1 Sample 10 mL	Amount 470 mL 10 mL	Batch Number 11522 11556	Prepared or Analyzed 05/24/17 08:06 05/24/17 11:23	 Lab TAL KNX TAL KNX
Total/NA	Instrumen Prep	ot ID: 1500 0050/26A			1 Sample	470 mL	11522	05/24/17 08:06	 TAL KNX

Client: URS Corporation

Project/Site: Suncoke Coke ICR - M26A

TestAmerica Job ID: 140-8107-1

Lab Sample ID: 140-8107-1 MSD

Matrix: Air

Date Collected: 05/05/17 00:00 Date Received: 05/16/17 13:05

> Batch Batch Dil Initial Final Batch Prepared

Prep Type Туре Method Run **Factor** Amount **Amount** Number or Analyzed Analyst Lab Total/NA 0050/26A Analysis 1000 10 mL 11556 TAL KNX 10 mL 05/24/17 11:58 JMH

Instrument ID: 1500

Client Sample ID: R-2430 R1 M26A IMPINGER

# Laboratory References:

TAL KNX = TestAmerica Knoxville, 5815 Middlebrook Pike, Knoxville, TN 37921, TEL (865)291-3000

# **Accreditation/Certification Summary**

Client: URS Corporation

Project/Site: Suncoke Coke ICR - M26A

TestAmerica Job ID: 140-8107-1

# Laboratory: TestAmerica Knoxville

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
	AFCEE		N/A	
Arkansas DEQ	State Program	6	88-0688	06-16-17
California	State Program	9	2423	06-30-18
Colorado	State Program	8	TN00009	02-28-18
Connecticut	State Program	1	PH-0223	09-30-17
Florida	NELAP	4	E87177	06-30-17
Georgia	State Program	4	906	04-13-20
Hawaii	State Program	9	N/A	04-13-18
Kansas	NELAP	7	E-10349	10-31-17
Kentucky (DW)	State Program	4	90101	12-31-17
L-A-B	DoD ELAP		L2311	02-13-19
Louisiana	NELAP	6	83979	06-30-17
Louisiana (DW)	NELAP	6	LA160005	12-31-17
Maryland	State Program	3	277	03-31-18
<b>V</b> iichigan	State Program	5	9933	04-13-17 *
Nevada	State Program	9	TN00009	07-31-17
New Jersey	NELAP	2	TN001	06-30-17
New York	NELAP	2	10781	03-31-18
North Carolina (DW)	State Program	4	21705	07-31-17
North Carolina (WW/SW)	State Program	4	64	12-31-17
Ohio VAP	State Program	5	CL0059	11-22-18
Oklahoma	State Program	6	9415	08-31-17
Pennsylvania	NELAP	3	68-00576	12-31-17
Tennessee	State Program	4	2014	04-13-20
Гехаѕ	NELAP	6	T104704380-16-9	08-31-17
JSDA	Federal		P330-13-00262	08-20-19
Jtah	NELAP	8	TN00009	07-31-17
/irginia	NELAP	3	460176	09-14-17
Washington	State Program	10	C593	01-19-18
West Virginia (DW)	State Program	3	9955C	12-31-17
West Virginia DEP	State Program	3	345	04-30-18
Visconsin	State Program	5	998044300	08-31-17

<sup>\*</sup> Accreditation/Certification renewal pending - accreditation/certification considered validation/



# ANALYTICAL REPORT

Job Number: 140-8108-1

Job Description: Suncoke - M8A

For:

URS Corporation 105 Mitchell Road, Suite 200 Oak Ridge, TN 37830

Attention: John Carson

Approved for release Courtney M Adkins Project Manager I 5/30/2017 12:15 PM

Courtney M Adkins, Project Manager I 5815 Middlebrook Pike, Knoxville, TN, 37921 (865)291-3000 courtney.adkins@testamericainc.com 05/30/2017

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# **Definitions/Glossary**

Client: URS Corporation Project/Site: Suncoke - M8A

TestAmerica Job ID: 140-8108-1

# Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
n	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# **Method Summary**

Client: URS Corporation Project/Site: Suncoke - M8A TestAmerica Job ID: 140-8108-1

Method	Method Description	Protocol	Laboratory
8A	Determination of Sulfuric Acid and Sulfur Dioxide Emissions	EPA	TAL KNX

# **Protocol References:**

EPA = US Environmental Protection Agency

# Laboratory References:

TAL KNX = TestAmerica Knoxville, 5815 Middlebrook Pike, Knoxville, TN 37921, TEL (865)291-3000

# **Sample Summary**

Client: URS Corporation Project/Site: Suncoke - M8A

TestAmerica Job ID: 140-8108-1

Lab Sample ID	Client Sample ID	Matrix	Collected Received
140-8108-1	R-2443 F2 R1 M8A IMP #1	Air	05/05/17 00:00 05/16/17 13:05
140-8108-2	R-2488 F2 R2 M8A IMP #1	Air	05/05/17 00:00 05/16/17 13:05
140-8108-3	R-2533 F2 R3 M8A IMP #1	Air	05/06/17 00:00 05/16/17 13:05
140-8108-4	R-2629 F2 QC M8A RB	Air	05/06/17 00:00 05/16/17 13:05

# Job Narrative 140-8108-1

### Sample Receipt

The samples were received on May 16, 2017 at 1:05 PM. The samples arrived in good condition and properly preserved. The temperature of the cooler at receipt was 22.0° C.

# **Quality Control and Data Interpretation**

Unless otherwise noted, all holding times, and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

## **General Chemistry**

Analysis of Stationary Source Emission Samples by Ion Chromatography: Samples were analyzed for sulfate by ion chromatography using SOP number KNOX-WC-005 (based on EPA methods 9056, 9057 and 8A). Results were reported as total µg sulfuric acid.

Results were calculated using the following equation:

Sulfuric Acid, µg = (Sulfate, µg/mL) × (Sample Volume, mL) × (Molecular Weight Sulfuric Acid / Molecular Weight Sulfate) × Bench DF

Note: A sample volume of 100 mL was used to convert the results to total µg for the method blanks, laboratory control samples, and client reagent blanks.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# **QC Association Summary**

Client: URS Corporation Project/Site: Suncoke - M8A

TestAmerica Job ID: 140-8108-1

# HPLC/IC

# Prep Batch: 11549

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-8108-1	R-2443 F2 R1 M8A IMP #1	Total/NA	Air	8A	<del>-</del>
140-8108-2	R-2488 F2 R2 M8A IMP #1	Total/NA	Air	8A	
140-8108-3	R-2533 F2 R3 M8A IMP #1	Total/NA	Air	8A	
140-8108-4	R-2629 F2 QC M8A RB	Total/NA	Air	8A	
MB 140-11549/3-A	Method Blank	Total/NA	Air	8A	
LCS 140-11549/1-A	Lab Control Sample	Total/NA	Air	8A	
LCSD 140-11549/2-A	Lab Control Sample Dup	Total/NA	Air	A8	
140-8108-2 MS	R-2488 F2 R2 M8A IMP #1	Total/NA	Air	8A	
140-8108-2 MSD	R-2488 F2 R2 M8A IMP #1	Total/NA	Air	8A	

# Analysis Batch: 11554

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-8108-1	R-2443 F2 R1 M8A IMP #1	Total/NA	Air	8A	11549
140-8108-2	R-2488 F2 R2 M8A IMP #1	Total/NA	Air	8A	11549
140-8108-3	R-2533 F2 R3 M8A IMP #1	Total/NA	Air	8A	11549
140-8108-4	R-2629 F2 QC M8A RB	Total/NA	Air	8A	11549
MB 140-11549/3-A	Method Blank	Total/NA	Air	8A	11549
LCS 140-11549/1-A	Lab Control Sample	Total/NA	Air	8A	11549
LCSD 140-11549/2-A	Lab Control Sample Dup	Total/NA	Air	8A	11549
140-8108-2 MS	R-2488 F2 R2 M8A IMP #1	Total/NA	Air	8A	11549
140-8108-2 MSD	R-2488 F2 R2 M8A IMP #1	Total/NA	Air	8A	11549

# Client Sample Results

Client: URS Corporation Project/Site: Suncoke - M8A

TestAmerica Job ID: 140-8108-1

Client Sample ID: R-2443 F2 R1 M8A IMP #1

Lab Sample ID: 140-8108-1

Date Collected: 05/05/17 00:00 Date Received: 05/16/17 13:05

Matrix: Air

Sample Container: Plastic 125mL - unpreserved

Method: 8A - Determination of Sulfuric Acid and Sulfur Dioxide Emissions

Analyte Result Qualifier RL MDL Unit D Prepared Analyzed Dil Fac Sulfuric acid 4080 71500 735 ug/Sample 05/24/17 08:00 05/24/17 10:56

Client Sample ID: R-2488 F2 R2 M8A IMP #1 Lab Sample ID: 140-8108-2

Date Collected: 05/05/17 00:00

Matrix: Air

Matrix: Air

Matrix: Air

Date Received: 05/16/17 13:05

Sample Container: Plastic 125mL - unpreserved

Method: 8A - Determination of Sulfuric Acid and Sulfur Dioxide Emissions

Analyte Result Qualifier MDL Unit RI D Prepared Analyzed Dil Fac 7150 Sulfuric acid 47400 1290 ug/Sample 05/24/17 08:00 05/24/17 11:22

Client Sample ID: R-2533 F2 R3 M8A IMP #1 Lab Sample ID: 140-8108-3

Date Collected: 05/06/17 00:00 Date Received: 05/16/17 13:05

Sample Container: Plastic 125mL - unpreserved

Method: 8A - Determination of Sulfuric Acid and Sulfur Dioxide Emissions

Analyte Result Qualifier RL MDL Unit D Prepared Analyzed Dil Fac 4080 05/24/17 08:00 05/24/17 12:24 Sulfuric acid 41000 735 ug/Sample

Client Sample ID: R-2629 F2 QC M8A RB Lab Sample ID: 140-8108-4

Date Collected: 05/06/17 00:00 Date Received: 05/16/17 13:05

Sample Container: Plastic 125mL - unpreserved

Method: 8A - Determination of Sulfuric Acid and Sulfur Dioxide Emissions

Analyte Result Qualifier RL MDL Unit ח Dil Fac Prepared Analyzed Sulfuric acid ND 102 18.4 ug/Sample 05/24/17 08:00 05/24/17 12:44

# **Default Detection Limits**

Client: URS Corporation Project/Site: Suncoke - M8A

TestAmerica Job ID: 140-8108-1

# Method: 8A - Determination of Sulfuric Acid and Sulfur Dioxide Emissions

Prep: 8A

Analyte	RL	MDL	Units	Method	
Sulfuric acid	102	18.4	ug/Sample	8A	

# **QC Sample Results**

Method: 8A - Determination of Sulfuric Acid and Sulfur Dioxide Emissions

Client: URS Corporation Project/Site: Suncoke - M8A

Matrix: Air

Analyte

Analysis Batch: 11554

Lab Sample ID: 140-8108-2 MSD

TestAmerica Job ID: 140-8108-1

Prep Type: Total/NA

%Rec.

Limits

D %Rec

Client Sample ID: R-2488 F2 R2 M8A IMP #1

Prep Batch: 11549

**RPD** 

RPD Limit

Lab Sample ID: MB 140-1154 Matrix: Air	9/3-A							Clie		ole ID: Metho Prep Type: T	
Analysis Batch: 11554										Prep Batch	
	MB	MB									
Analyte	Result	Qualifier		RL	MDL	Unit	D	Pi	repared	Analyzed	Dil Fac
Sulfuric acid Lab Sample ID: LCS 140-115	ND 49/1-A			102	18.4	ug/Samp				05/24/17 10:04  Lab Control	Sample
			Snike						mple ID:	Lab Control : Prep Type: T Prep Batch	otal/NA
Lab Sample ID: LCS 140-1154 Matrix: Air			Spike Added	LC	18.4  LCS		Client		mple ID:	Lab Control : Prep Type: T	otal/NA

Sulfuric acid		-	255	253.9		ug/Sample	-	99	90 - 110	1	20
Lab Sample ID: 140-81 Matrix: Air	108-2 MS				С	lient Samp	le I	D: R-24	88 F2 R2 Prep Tyl		
Analysis Batch: 11554									Prep B	latch: 1	1549
	Sample	Sample	Spike	MS	MS				%Rec.		
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits		
Sulfuric acid	47400		35700	83160		ug/Sample	_	100	75 125		

LCSD LCSD

Result Qualifier Unit

Spike

Added

I	Matrix: Air									Prep Ty	pe: Tot	al/NA
	Analysis Batch: 11554									Prep E	Batch:	11549
		Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
ı	Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
	Sulfuric acid	47400		35700	83300		ug/Sample	_	101	75 - 125	0	20

Client: URS Corporation Project/Site: Suncoke - M8A

TestAmerica Job ID: 140-8108-1

Client Sample ID: R-2443 F2 R1 M8A IMP #1

Date Collected: 05/05/17 00:00

Lab Sample ID: 140-8108-1

Matrix: Air

	Date	Received:	05/16/17	13:05
--	------	-----------	----------	-------

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	8A	7/7		1 Sample	40 mL	11549	05/24/17 08:00	JMH	TAL KNX
Total/NA	Analysis	8A		100	10 mL	10 mL	11554	05/24/17 10:56	JMH	TAL KNX
	Instrumer	nt ID: 320								

Client Sample ID: R-2488 F2 R2 M8A IMP #1

Date Collected: 05/05/17 00:00

Date Received: 05/16/17 13:05

Lab Sample ID: 140-8108-2

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analvst	Lab
Total/NA	Prep	8A			1 Sample	70 mL	11549	05/24/17 08:00		TAL KNX
Total/NA	Analysis	8A		100	10 mL	10 mL	11554	05/24/17 11:22	JMH	TAL KNX
	Instrumen	t ID: 320								

Client Sample ID: R-2533 F2 R3 M8A IMP #1

Date Collected: 05/06/17 00:00

Date Received: 05/16/17 13:05

Lab Sample ID: 140-8108-3

Matrix: Air

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	8A			1 Sample	40 mL	11549	05/24/17 08:00	JMH	TAL KNX
Total/NA	Analysis	8A		100	10 mL	10 mL	11554	05/24/17 12:24	JMH	TAL KNX
	Instrumer	nt ID: 320								

Client Sample ID: R-2629 F2 QC M8A RB

Date Collected: 05/06/17 00:00

Date Received: 05/16/17 13:05

Lab Sample ID: 140-8108-4

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	8A			1 Sample	100 mL	11549	05/24/17 08:00	JMH	TAL KNX
Total/NA	Analysis	8A		1	10 mL	10 mL	11554	05/24/17 12:44	JMH	TAL KNX
	instrumer	nt ID: 320								

Client Sample ID: Method Blank

Date Collected: N/A

Date Received: N/A

Lab Sample ID: MB 140-11549/3-A

Matrix: Air

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	8A			1 Sample	100 mL	11549	05/24/17 08:00	JMH	TAL KNX
Total/NA	Analysis	8A		1	10 mL	10 mL	11554	05/24/17 10:04	JMH	TAL KNX
	Instrumer	nt ID: 320								

Client: URS Corporation Project/Site: Suncoke - M8A TestAmerica Job ID: 140-8108-1

Client Sample ID: Lab Control Sample

Date Collected: N/A

Matrix: Air

**Analyst** 

Lab

Matrix: Air

TAL KNX

Matrix: Air

Lab Sample ID: LCS 140-11549/1-A

05/24/17 09:41 JMH

Lab Sample ID: 140-8108-2 MSD

Date Received: N/A

Batch Batch Dil Initial Final Batch Prepared Prep Type Type Method Run **Factor Amount** Amount Number or Analyzed

Total/NA Prep 8A 100 mL 11549 TAL KNX 1 Sample 05/24/17 08:00 **JMH** Total/NA Analysis 8A 10 mL 10 mL 11554 05/24/17 09:18 JMH TAL KNX

Instrument ID: 320

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 140-11549/2-A

Date Collected: N/A

Date Received: N/A

Batch Batch Dil Initial Final Batch Prepared Method Prep Type Type Run **Factor Amount Amount** Number or Analyzed **Analyst** Lab Total/NA Prep 1 Sample 100 mL 11549 05/24/17 08:00 TAL KNX **JMH** Total/NA A8

10 mL

10 mL

11554

1

Instrument ID: 320

Analysis

Client Sample ID: R-2488 F2 R2 M8A IMP #1

Lab Sample ID: 140-8108-2 MS Date Collected: 05/05/17 00:00 Matrix: Air

Date Received: 05/16/17 13:05

**Batch** Batch Dil Initial Final Batch **Prepared** Prep Type Method Type Run **Factor** Number Amount **Amount** or Analyzed Analyst Lab Total/NA 8A Prep 1 Sample 70 mL 11549 05/24/17 08:00 TAL KNX **JMH** Total/NA Analysis 8A 100 10 mL 10 mL 11554 05/24/17 11:45 JMH TAL KNX Instrument ID: 320

Client Sample ID: R-2488 F2 R2 M8A IMP #1

Date Collected: 05/05/17 00:00

Date Received: 05/16/17 13:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	8A	* **		1 Sample	70 mL	11549	05/24/17 08:00	JMH	TAL KNX
Total/NA	Analysis	8A		100	10 mL	10 mL	11554	05/24/17 12:05	JMH	TAL KNX
	Instrumer	nt ID: 320								

### Laboratory References:

TAL KNX = TestAmerica Knoxville, 5815 Middlebrook Pike, Knoxville, TN 37921, TEL (865)291-3000

# **Accreditation/Certification Summary**

Client: URS Corporation Project/Site: Suncoke - M8A

TestAmerica Job ID: 140-8108-1

# Laboratory: TestAmerica Knoxville

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	<b>Expiration Date</b>
	AFCEE		N/A	
Arkansas DEQ	State Program	6	88-0688	06-16-17
California	State Program	9	2423	06-30-18
Colorado	State Program	8	TN00009	02-28-18
Connecticut	State Program	1	PH-0223	09-30-17
Florida	NELAP	4	E87177	06-30-17
Georgia	State Program	4	906	04-13-20
-lawaii	State Program	9	N/A	04-13-18
Kansas	NELAP	7	E-10349	10-31-17
Kentucky (DW)	State Program	4	90101	12-31-17
L-A-B	DoD ELAP		L2311	02-13-19
Louisiana	NELAP	6	83979	06-30-17
Louisiana (DW)	NELAP	6	LA160005	12-31-17
Maryland	State Program	3	277	03-31-18
Michigan	State Program	5	9933	04-13-17 *
Nevada	State Program	9	TN00009	07-31-17
New Jersey	NELAP	2	TN001	06-30-17
New York	NELAP	2	10781	03-31-18
North Carolina (DW)	State Program	4	21705	07-31-17
North Carolina (WW/SW)	State Program	4	64	12-31-17
Ohio VAP	State Program	5	CL0059	11-22-18
Oklahoma	State Program	6	9415	08-31-17
Pennsylvania	NELAP	3	68-00576	12-31-17
Tennessee	State Program	4	2014	04-13-20
Texas	NELAP	6	T104704380-16-9	08-31-17
JSDA	Federal		P330-13-00262	08-20-19
Jtah	NELAP	8	TN00009	07-31-17
/irginia	NELAP	3	460176	09-14-17
Vashington	State Program	10	C593	01-19-18
West Virginia (DW)	State Program	3	9955C	12-31-17
Nest Virginia DEP	State Program	3	345	04-30-18
Visconsin	State Program	5	998044300	08-31-17

05/30/2017

<sup>\*</sup> Accreditation/Certification renewal pending - accreditation/certification considered valid.

Appendix E
CALIBRATION INFORMATION

Plant Name Sampling Location Date CEM Operator Project Number

Gateway Energy & Coke
Bypass Stack 5
May 5-6, 2017
Chandra Sastry
60542107

# **Observed Values**

# **Bias-Adjusted Values**

Run No.	Date	Start	Stop	Start - Stop	Reference	Reference Method Adj. Value	Value
		Time	Time	Time	$O_2$	CO <sub>2</sub>	NOX
1	5/5/2017	1520	1641	1520 - 1641	9.7	7.0	34.61
2	5/5/2017	1930	2115	1930 - 2115	7.7	8.5	49.34
3	5/6/2017	1320	1500	1320 - 1500	11.7	5.5	24.04

# **CEM CALIBRATION DATA**

Sampling Location

Bypass Stack 5 5-May-17

CEM Operator Project Number Plant Name Plant Rep. Team Leader

60542107

Chris Decioccio Chandra Sastry John Carson

Gateway Energy & Coke

Ì		5	_	00
	Cal Span	20.95	20.61	91.48
	Analyzer#	05230A1	11047	
		02	C02	XON

			Data to be Entered	Entered by Operator			(Pre Run n+1)	= (Post Run n)	(Pre Run n+1) = (Post Run n) unless overridden	len
	Calibration	CALIB	CALIBRATION ERROR CHECK	HECK			SYSTEM CAL CHECK	AL CHECK		
	Gas	Calibration		Analyzer	Pre Run 1	Post Run 1	Pre Run 2	Post Run 2	Pre Run 3	Post Run 3
	Specification	Value	Cylinder	Calibration	System	System	System	System	System	System
	(% of Span)	(% or ppm)	Number (1)	Response	Response	Response	Response	Response	Response	Response
O2 Zero	0	0	UHP Nitrogen	-0.10	-0.16	-0.22	-0.22	-0.22	-0.22	-0.19
O2 Low	NR									
O2 Mid	40-60	9.85	XC033319B	9.92	9.83	9.73	9.73	9.76	9.76	9.81
O2 High	100	20.95	EB0039392	20.85						
CO2 Zero	0	0	UHP Nitrogen	0.02	0.16	0.18	0.18	0.15	0.15	0.23
CO2 Low	NR								1000	
CO2 Mid	40-60	10.25	XC033319B	10.01	9.91	9.93	66.6	99.6	9.66	10.19
CO2 High	100	20.61	EB0039392	20.58						
NOX Zero	0	0	UHP Nitrogen	0.10	0.20	0.40	0.40	0.40	0.40	0.20
NOX Low	NR						×			
NOX Mid	40-60	45.82	CC417042	45.40	44.40	45.20	45.20	44.50	44,50	44.60
NOX High	100	91.48	CC220278	92.50						

# O2 Corrdata

# **CEM Data Correction Data Sheet**

Plant Name	Ľ
Sampling Location	
Date	
CEM Operator	
Project Number	
Pollutant	

Chandra Sastry	60542107	05
	Chandra Sastry	Chandra Sastry 60542107

Corrected	Data	(% or ppm)	9.7	7.7	11.7	
	ıta	шЭ	8.6	9.7	9.8	
	Calibration Data	°C0	-0.2	-0.2	-0.2	
	Ö	Ста	6.6	6.6	6.6	
	Obs. Conc.	(% or ppm)	9.6	7.6	11.7	
	Stop	Time	1641	2115	1500	
	Start	Time	1520	1930	1320	
		Run No.	•	2	3	

Calibration

Calibration Error Correction Cgas=(Cobs-Co)\*(Cma/(Cm-Co))

### CO2 Corrdata

# **CEM Data Correction Data Sheet**

	Location		rator	nmber	
Plant Name	Sampling Location	Date	CEM Operator	Project Number	<b>Pollutant</b>

Bypass Stack 5 5-May-17 Chandra Sastry 60542107 CO <sub>2</sub>						
<u>හී                                      </u>	Gateway Energy & Coke	Bypass Stack 5	5-May-17	Chandra Sastry	60542107	CO <sub>2</sub>

Calibration Corrected	Data	(% or ppm)	7.0	8.5	5.5
7	ıta	Cm	6.6	9.8	9.6
	Calibration Data	တ	0.2	0.2	0.2
	Ö	Ста	10.3	10.3	10.3
	Obs. Conc.	(% or ppm)	6.9	8.1	5.4
	Stop	Time	1641	2115	1500
	Start	Time	1520	1930	1320
		Run No.	-	2	3

Calibration Error Correction Cgas=(Cobs-Co)\*(Cma/(Cm-Co))

### **NOX Corrdata**

# **CEM Data Correction Data Sheet**

Plant Name Sampling Location	
Date	-
CEM Operator	-
Project Number	_

Pollutant

_	_	_	_	_	_
Gateway Energy & Coke	Bypass Stack 5	5-May-17	Chandra Sastry	60542107	XON

Calibration Error Correction Cgas=(Cobs-Co)\*(Cma/(Cm-Co))

### **CEM CALIBRATION DATA**

Sampling Location	Bypass Stack
Date	5-May-17
Run Number	1
Start Time	41398
Stop Time	1520

Plant Name	Plant Rep.	Team Leader	CEM Operator	Project Number
Bypass Stack 5	5-May-17	1	41398	1520

Gateway Energy & Coke	Chris Decioccio	John Carson	Chandra Sastry	F0101
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-	Analyzer	Calibration
	Number	Span
05	05230A1	20,95
005	11047	20,61
XON		91.48

	Calibration	CALIBRATIC	CALIBRATION ERROR CHECK				SYS	SYSTEM CAL CHECK	ECK		
	Gas	Calibration		Analyzer		Pre Run	3nn 1	Post Run	Run 1		Calibration
	Specification	Value	Cylinder	Calibration		System	Syst. Bias	System	Syst. Bias	Drift	Correction
	(% of Span)	(% or ppm)	Number (1)	Response	(% of Span)	Response	(% of Span)	Response	(% of Span)	(% of Span)	Factors
O2 Zero	0	0	O UHP Nitrogen	-0.1	-0.48%	-0.16	-0.29%	72'0-	-0.57%	-0.29%	-Co=0.2
O2 Low	NR										
O2 Mid	40-60		9.85 XC033319B	9.92	0.33%	9.83	-0.43%	9.73	-0.91%	-0.48%	Cm=9.8
O2 High	100		20.95 EB0039392	20.85	-0.48%						
CO2 Zero	0		0 UHP Nitrogen	0.05	0.24%	0.16	0.53%	0.18	%89.0	0.10%	Co=0.2
CO2 Low	NR										
CO2 Mid	40-60		10.25 XC033319B	10.01	-1.16%	9.91	-0.49%	9.93	-0.39%	0.10%	Cm=9.9
CO2 High	100	20,61	EB0039392	20.58	-0.15%						
NOX Zero	0	0	0 UHP Nitrogen	0.1	0.01%	0.2	0.11%	0.4	0.33%	0.22%	Co=0.3
NOX Low	NR										
NOX Mid	40-60		45.82 CC417042	45.4	-0.04%	44.4	-1.09%	45.2	-0.22%	0.87%	Cm=44.8
NOX High	100		91,48 CC220278	92.5	0.10%						

Calibration Error = 
$$\left(\frac{Analyzer\ Response}{Analyzer\ Span}\right) \times 100$$
; allowable error =  $\pm 2\%$   
System Bias =  $\left(\frac{System\ Response}{Analyzer\ Span}\right) \times 100$ ; allowable error =  $\pm 5\%$   
Drift =  $\left(\frac{Post\ Test\ System\ Response}{Analyzer\ Span}\right) \times 100$ ; allowable error =  $\pm 3\%$   
 $C_0 = \left(\frac{Pre\ Test\ System\ Zero\ Response}{Analyzer\ Span}\right) \times 100$ ; allowable error =  $\pm 3\%$   
 $C_0 = \left(\frac{Pre\ Test\ System\ Zero\ Response}{Analyzer\ Span}\right) \times 100$ ; allowable error =  $\pm 3\%$ 

### **CEM CALIBRATION DATA**

Bynase S	Condi	5-May	2	4139	103/
Rypass Stack 5	2 10 10 10	5-May-17	2	41398	1930

Plant Name	Plant Rep	Team Leader	CEM Operator	Project Number
Bypass Stack 5	5-May-17	2	41398	1930

Gateway Energy & Coke	Chris Decioccio	John Carson	Chandra Sastry	60542107
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	Analyzer	Calibration
	Number	Span
02	05230A1	20.95
C02	11047	20.61
XON		91.48

	Calibration	CALIBRATIC	CALIBRATION ERROR CHECK				SYS	SYSTEM CAL CHECK	:CK		
	Gas	Calibration		Analyzer		Pre F	Pre Run 2	Post	Post Run 2		Calibration
	Specification	Value	Cylinder	Calibration	Difference	System	Syst. Bias	System	Syst. Bias	Drift	Correction
	(% of Span)	(% or ppm)	Number (1)	Response	(% of Span)	Response	(% of Span)	Response	(% of Span)	(% of Span)	Factors
O2 Zero	0	0	0 UHP Nitrogen	-0.1	-0.48%	-0.22	%250-	-0,22	-0.57%	%00'0	-Co=0.2
O2 Low	NR										
O2 Mid	40-60		9.85 XC033319B	8,92	0.33%	62'6	-0.91%	92.6	~92'0-	0.14%	Cm=9.7
O2 High	100		20.95 EB0039392	20.85	-0.48%						
CO2 Zero	0	0	0 UHP Nitrogen	90'0	0.24%	0.18	%69'0	0,15	0.49%	-0.15%	Co=0.2
CO2 Low	NR										
CO2 Mid	40-60		10.25 XC033319B	10.01	-1.16%	6.93	%66.0-	99.6	-1.70%	-1.31%	Cm=9.8
CO2 High	100		20.61 EB0039392	20.58	-0.15%						
NOX Zero	0	0	0 UHP Nitrogen	0.1	0.01%	0.4	0.33%	0.4	0.33%	%00'0	Co=0.4
NOX Low	NR										
NOX Mid	40-60		45.82 CC417042	45.4	-0.04%	45.2	-0.22%	44.5	%86.0-	%220-	Cm=44.9
NOX High	100		91.48 CC220278	92.5	0.10%			X			

Calibration Error = 
$$\left(\frac{\text{Analyzer Response}}{\text{Analyzer Span}} - \text{Calibration Value}\right) \times 100$$
; allowable error =  $\pm 2\%$ 

System Bias =  $\left(\frac{\text{System Response}}{\text{Analyzer Span}} - \text{Analyzer Response}\right) \times 100$ ; allowable error =  $\pm 3\%$ 

Drift =  $\left(\frac{\text{Post Test System Response}}{\text{Analyzer Span}} \times 100$ ; allowable error =  $\pm 3\%$ 
 $C_0 = \left(\frac{\text{Pre Test System Zero Response}}{\text{Analyzer Span}}\right) \times 100$ ; allowable error =  $\pm 3\%$ 
 $C_0 = \left(\frac{\text{Pre Test System Zero Response}}{\text{Analyzer Span}}\right)$ 

### **CEM CALIBRATION DATA**

Sampling Location	Bypass Stack 5
Date	6-May-17
Run Number	3
Start Time	41399
Stop Time	1320

Plant Name	Plant Rep,	Team Leader	CEM Operator	Project Number
Bypass Stack 5	6-May-17	3	41399	1320

Gateway Energy & Coke	Chris Decioccio	John Carson	Chandra Sastry	COE40403

	Analyzer	Calibration
	Number	Span
02	05230A1	20.95
C02	11047	20,61
XON		91.48

	Calibration	CALIBRATIC	CALIBRATION ERROR CHECK				SYS	SYSTEM CAL CHECK	Č.		
	Gas	Calibration		Analyzer		Pre F	Pre Run 3	Post	Post Run 3		Calibration
	Specification	Value	Cylinder	Calibration	Difference	System	Syst, Bias	System	Syst, Bias	Drift	Correction
	(% of Span)	(% or ppm)	Number (1)	Response	(% of Span)	Response	(% of Span)	Response	(% of Span)	(% of Span)	Factors
O2 Zero	0	0	0 UHP Nitrogen	-0.1	-0.48%	-0.22	%25'0-	-0.19	-0.43%	0.14%	-Co=0.2
O2 Low	NR										
O2 Mid	40-60		9.85 XC033319B	9.92	0.33%	92.6	%9Z'0 <del>-</del>	9.81	-0.53%	0.24%	Cm=9.8
O2 High	100		20.95 EB0039392	20.85	-0.48%						
CO2 Zero	0	0	0 UHP Nitrogen	0'02	0.24%	0.15	0.49%	0.23	0.87%	%68.0	Co=0.2
CO2 Low	NR										
CO2 Mid	40-60		10.25 XC033319B	10.01	-1.16%	99'6	-1.70%	10.19	%180	2.57%	Cm=9.9
CO2 High	100		20.61 EB0039392	20.58	-0.15%						
NOX Zero	0	0	UHP Nitrogen	0.1	0.01%	0.4	0.33%	0.2	0.11%	-0.22%	Co=0.3
NOX Low	N.										
NOX Mid	40-60		45,82 CC417042	42.4	-0.04%	44.5	%86.0-	44.6	-0.87%	0.11%	Cm=44.6
NOX High	100		91,48 CC220278	92.5	0.10%						

Calibration Error = 
$$\left(\frac{Analyzer\ Response - Calibration\ Value}{Analyzer\ Span}\right) \times 100$$
; allowable error =  $\pm 2\%$ 

System Bias =  $\left(\frac{System\ Response - Analyzer\ Span}{Analyzer\ Span}\right) \times 100$ ; allowable error =  $\pm 5\%$ 

Drift =  $\left(\frac{Post\ Test\ System\ Response - Pre\ Test\ System\ Response}{Analyzer\ Span}\right) \times 100$ ; allowable error =  $\pm 3\%$ 

$$C_0 = \left(\frac{Pre\ Test\ System\ Zero\ Response + Post\ Test\ System\ Zero\ Response}{2}\right)$$

$$C_m = \left(\frac{Pre\ Test\ System\ Upscale\ Response + Post\ Test\ System\ Upscale\ Response}{2}\right)$$

### NO<sub>2</sub>-NO Converter Efficiency Test (NO<sub>2</sub> Cylinder Method)

Date: 5/4/2017
Project: GECC CD Test
Analyzer: Thermo Environmental
Model: 42i-HL
S/N: 828232281

Location:
Technician:
Operating Range:

Bypass Stack 5
Chandra Sastry
0-100

Cylinder Number	Cal Gas Concentration	NO <sub>x</sub> Analyzer Response in Direct Cal Mode
CC504828	50.19	45.4

Converter Efficiency =

90.5 % (Must be greater than or equal to 90 percent)

### **Procedures**

- 1. Calibrate analyzer
- 2. Introduce a 40 to 60 ppmv  $NO_2$  calibration gas cylinder to the analyzer in direct cal mode and record the  $NO_x$  response.
- 3. Calculate efficiency.

### NOX Conv Test 050417

Time	02	CO2	NOX
9:43	-0.22	0.05	0.1
9:44	13.32	0.05	10.6
9:45	20.64	0.05	34.7
9:46	20.73	0.05	38.5
9:47	20.78	0.04	40
9:48	20.8	0.05	40.6
9:49	20.83	0.05	41
9:50	20.86	0.05	41.5
9:51	20.88	0.05	42.3
9:52	20.9	0.05	42.9
9:53	20.97	0.05	43.3
9:54	21.01	0.05	43.7
9:55	21.1	0.05	44
9:56	21.44	0.05	44.3
9:57	21.38	0.05	44.5
9:58	21.45	0.05	44.7
9:59	21.39	0.05	44.8
10:00	21.41	0.05	45
10:01	21.65	0.05	45.1
10:02	21.99	0.06	45.3
10:03	22.29	80.0	45.4
10:04	22.55	0.09	45.4

### **Direct Cal 2 for 050517**

Time	02	CO2	NOX
12:20	9.71	9.99	0.2
12:21	1.78	1.63	42.8
12:22	-0.14	0.22	91.9
12:23	-0.2	0.15	92.5
12:24	-0.19	0.15	79.5
12:25	-0.25	0.09	46.1
12:26	-0.25	0.08	45.4
12:27	-0.21	0.1	32.9
12:28	-0.25	0.09	2.3
12:29	-0.25	0.09	1.7
12:30	-0.13	0.09	2.7
12:31	-0.26	0.08	8.0
12:32	-0.26	0.07	0.5
12:33	0.12	0.05	0.6
12:34	0.14	0.05	0.4
12:35	0.34	0.06	0.2
12:36	1.15	0.06	0.1
12:37	2.09	0.07	1
12:38	-0.01	0.19	0.4
12:39	0.18	0.18	0.1

### **System Cal 2 for 050517**

Time	02	CO2	NOX
12:41	8.59	5.62	29.5
12:42	0.58	0.33	2.8
12:43	-0.22	0.26	0.3
12:44	-0.23	0.23	0.2
12:45	-0.56	0.23	0.2
12:46	-0.23	0.22	0.2
12:47	-0.24	0.21	31.3
12:48	-0.24	0.19	44.5
12:49	-0.24	0.16	44.6
12:50	-0.24	0.15	44.4
12:51	-0.24	0.14	14.1
12:52	-0.25	0.14	0.7
12:53	-0.25	0.14	0.6
12:54	-0.25	0.14	0.5
12:55	-0.25	0.13	0.7
12:56	-0.25	0.13	1.2
12:57	-0.26	0.13	0.2
12:58	-0.26	0.13	0.2
12:56 12:57	-0.25 -0.26	0.13 0.13	1.2 0.2

### Run 1 Data

Time	00	000	NOV
Time 15:20	<b>02</b> 9.37	CO2	NOX 32.8
		7.02 6.95	32.6 32.7
15:21	9.43		
15:22	9.4	7	32.3
15:23	9.21	7.18	32.5
15:24	9.21	7.16	32.3
15:25	9.44	6.95	32.4
15:26	9.45	6.95	33.4
15:27	9.35	7.08	33
15:28	9.23	7.22	32.4
15:29	9.18	7.26	32.8
15:30	9.24	7.23	32.7
15:31	9.29	7.15	32.9
15:32	9.3	7.15	32.7
15:33	9.51	6.92	33.7
15:34	9.42	7.01	34.7
15:35	9.39	7.05	34.4
15:36	9.36	7.07	34
15:37	9.52	6.93	33.6
15:38	9.48	6.96	33.5
15:39	9.45	6.98	33.7
15:40	9.58	6.86	34.3
15:41	9.5	6.94	34.6
15:42	9.38	7.06	33.6
15:43	9.51	6.93	33.7
15:44	9.52	6.94	33.6
15:45	9.45	7	33.5
15:46	9.48	6.97	33.6
15:47	9.51	6.96	34.5
15:48	9.52	6.96	34.8
15:49	9.49	6.99	34.5
15:50	9.45	7.03	34.3
15:51	9.55	6.93	34.9
15:52	9.66	6.83	34.8
15:53	9.73	6.76	35.1
15:54	9.68	6.81	34.9
15:55	9.75	6.75	33.9
15:56	9.67	6.82	34.1
15:57	9.67	6.82	34.1
15:58	9.58	6.92	33.8
15:59	9.49	7.01	34.2
	9.49 9.55		33.4
16:00		6.94 6.89	33.3
16:01	9.58		
16:02	9.77	6.68	34.5
16:03	9.73	6.71	34.3
16:04	9.73	6.69	34.7
16:05	9.9	6.53	35.1
16:06	9.87	6.56	35.5
16:07	9.71	6.73	34.7
16:08	9.84	6.59	33.8
16:09	9.83	6.6	34.2
16:10	9.83	6.63	34.7
16:11	9.67	6.79	34.8
16:12	9.67	6.77	34.1
16:13	9.77	6.69	34.4

### Run 1 Data

16:14	9.71	6.74	34.7
16:15	9.8	6.68	34.4
16:16	9.66	6.79	33.8
16:17	9.7	6.73	34.1
16:18	9.73	6.73	34.4
16:19	9.65	6.81	34
16:20	9.53	6.93	33.6
16:21	9.48	6.98	33.5
16:22	9.47	6.99	33.2
16:23	9.63	6.83	33.4
16:24	9.61	6.87	33.7
16:25	9.65	6.82	33.4
16:26	9.63	6.85	34
16:27	9.68	6.79	34.5
16:28	9.7	6.76	33.7
16:29	9.73	6.73	33.3
16:30	9.8	6.66	34.1
16:31	9.78	6.7	34.1
16:32	9.74	6.75	34
16:33	9.66	6.8	33.8
16:34	9.82	6.63	34
16:35	9.71	6.77	33.9
16:36	9.67	6.81	34.9
16:37	9.62	6.85	35.1
16:38	9.61	6.87	35
16:39	9.67	6.82	34.6
16:40	9.84	6.65	33.4
16:41	9.63	6.83	33.5
Average	9.6	6.9	33.9

### Post Run 1 050517

Time	02	CO2	ИОХ
17:20	10.13	6.31	35.9
17:21	10.11	6.37	35.1
17:22	10.23	6.25	36.3
17:23	7.11	4.23	34.9
17:24	-0.18	0.25	6.4
17:25	-0.22	0.18	0.4
17:26	-0.23	0.15	0.3
17:27	-0.24	0.14	0.3
17:28	3.46	3.69	0.3
17:29	9.71	9.85	0.3
17:30	9.73	9.93	0.3
17:31	9.74	9.98	0.3
17:32	9.74	10.01	0.3
17:33	6.2	5.06	13.2
17:34	-0.19	0.3	41.9
17:35	-0.22	0.2	45
17:36	-0.23	0.17	45.2
17:37	-0.24	0.15	45.1
17:38	-0.23	0.16	44.5
17:39	-0.25	0.13	14.7
17:40	-0.25	0.16	0.9
17:41	-0.26	0.31	0.7
17:42	-0.26	0.39	0.4
17:43	0.65	0.93	0.7
17:44	-0.24	0.23	2.7
17:45	-0.25	0.12	0.5
17:46	-0.25	0.11	0.5
17:47	-0.25	0.13	0.5
17:48	-0.26	0.18	0.4

### Run 2 Data

MINE CONTRACTOR	00000	000	NOV
19:30	<b>O2</b> 10.47	CO2	33.5
19:30	10.47	5.86 5.64	33.5 33.1
19:31	10.7	5.62	31.7
19:32	10.74	5.62 5.61	32.5
19:33	10.77	5.01	33.6
19:34	10.48	5.95	33.0
19:36	10.35	5.95 5.97	33.5
19:37	9.87	6.49	36.8
19:37	9.88	6.42	38.7
19:39	9.88	6.36	36. <i>1</i> 37.8
19:39	9.93 9.77	6.53	37.0
19:41	9.36	6.91	38.2
19:42	9.05	7.12	37.6
19:43	8.93	7.12	38.7
19:44	8.44	7.71	45.2
19:45	8.47	7.66	44.7
19:46	8.48	7.62	43.9
19:47	8.38	7.74	44.6
19:48	8.03	8.03	45.3
19:49	7.79	8.18	44.4
19:50	7.67	8.29	44.5
19:51	7.25	8.69	51.6
19:52	7.5	8.44	53.2
19:53	7.64	8.24	50.2
19:54	7.66	8.24	46.3
19:55	7.5	8.38	46.7
19:56	7.28	8.54	46.9
19:57	7	8.72	48.8
19:58	6.76	8.97	51.8
19:59	6.69	9.02	57
20:00	7	8.69	54.9
20:01	7.05	8.64	50.9
20:02	6.9	8.78	51.1
20:03	6.83	8.81	50.8
20:04	6.8	8.82	50.9
20:05	6.62	9	52
20:06	6.41	9.15	53.1
20:07	6.66	8.92	52.7
20:08	6.63	8.96	51.7
20:09	6.78	8.83	50.8
20:10	6.7	8.87	51.4
20:11	6.8	8.78	50.7
20:12	6.82	8.76	50.2
20:13	6.69	8.87	50.3
20:14	6.54	8.97	50.5
20:15	6.66	8.87	49.9
20:16	6.69	8.84	49.4
20:17	6.53	8.96	50.7
20:18	6.6	8.94	50.1
20:19	6.56	8.92	50.2
20:20	6.54	8.94	50.3
20:21	6.69	8.83	50.2
20:22	6.66	8.83	50.1
20:23	6.73	8.78	49.9

### Run 2 Data

20:24	6.64	8.85	50.2
20:25	6.69	8.77	50.1
20:26	6.58	8.89	50.3
20:27	6.58	8.88	50.9
20:28	6.7	8.77	50.5
20:29	6.79	8.68	50.5
20:30	6.91	8.61	50.6
20:31	6.97	8.54	51.1
20:32	6.99	8.5	50.7
20:33	6.94	8.56	51.1
20:34	7.01	8.5	51.1
20:35	7.07	8.46	50.8
20:36	7.02	8.5	51
20:37	7.03	8.48	51
20:38	7.05	8.46	50.9
20:39	7.29	8.28	50.6
20:40	7.16	8.37	51.3
20:41	7.11	8.43	51.3
20:42	7.01	8.5	51.2
20:43	7.07	8.44	51
20:44	7.16	8.37	50.9
20:45	7.18	8.37	51.6
20:46	7.29	8.25	51
20:47	7.43	8.14	50.6
20:48	7.34	8.22	50.6
20:49	7.37	8.18	50.8
20:50	7.39	8.17	51
20:51	7.43	8.15	50.4
20:52	7.33	8.23	51.3
20:53	7.45	8.12	50.9
20:54	7.42	8.16	50.7
20:55	7.43	8.14	51.1
20:56	7.53	8.06	50.8
20:57	7.59	7.99	50.3
20:58	7.67	7.93	50.5
20:59	7.71	7.89	50
21:00	7.67	7.94	50.2
21:01	7.62	7.98	50.5
21:02	7.68	7.92	50.5
21:03	7.7	7.9	50.6
21:04	7.75	7.87	50
21:05	7.82	7.8	49.8
21:06	7.74	7.88	50.5
21:07	7.76	7.84	50.5
21:08	7.85	7.77	50.2
21:09	7.9	7.73	50.3
21:10	7.95	7.69	49.9
21:11	7.86	7.77	50
21:12	7.91	7.73	50
21:13	7.86	7.76	50.6
21:14	7.91	7.71	50
21:15	7.95	7.7	50.2
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Average	7.6	8.1	48.3

### Post Run 2 050517

Time	02	CO2	ИОХ
21:21	6.49	6.07	50.2
21:22	-0.17	0.33	14.4
21:23	-0.21	0.2	0.6
21:24	-0.22	0.15	0.4
21:25	-0.23	0.13	0.3
21:26	-0.23	0.11	0.3
21:27	7.3	7.19	0.2
21:28	9.74	9.58	0.2
21:29	9.76	9.66	0.2
21:30	9.76	9.7	0.2
21:31	9.77	9.73	0.2
21:32	0.99	1.33	17.5
21:33	-0.2	0.22	44.1
21:34	-0.22	0.16	44.4
21:35	-0.23	0.13	44.5
21:36	-0.24	0.15	44.7
21:37	-0.23	0.16	44.5
21:38	-0.23	0.16	13.9
21:39	-0.23	0.16	8.0
21:40	-0.26	0.25	0.7
21:41	-0.26	0.33	0.3
21:42	0.34	0.87	0.6
21:43	-0.24	0.23	2.9
21:44	-0.24	0.12	0.5
21:45	-0.24	0.12	0.4
21:46	-0.25	0.12	0.4
21:47	-0.26	0.14	0.4

### Direct Cal for 050617

02	CO2	NOX
20.76		0.1
8.05		0.3
0	0	0.1
-0.14	0	0
14.92	14.84	0.2
20.82	20.31	0
20.88	20.57	0
20.87	20.6	0
20.82	20.41	0
11.25	11,12	0.1
9.9	10.01	0
8.74	8.62	0
0.54	0.5	58.5
0.26	0.11	91.2
0.41	0.07	91.5
0.19	0.06	45.9
0.55	0.02	44.9
0.24	0.02	44.8
1.4	0.05	37.4
2.22	0	1.1
2.8	0	0.4
2.13	0	0.3
0.83	0.01	0.4
0.63	0	0.2
0.6	0	0.2
0.47	0	0.4
0.77	0	1.7
0.97	0	1.5
0.84	0.01	1.3
0.84	0	0.5
0.99	-0.01	0.3
	20.76 8.05 0 -0.14 14.92 20.82 20.88 20.87 20.82 11.25 9.9 8.74 0.54 0.26 0.41 0.19 0.55 0.24 1.4 2.22 2.8 2.13 0.83 0.63 0.63 0.67 0.77 0.97 0.84 0.84	20.76       0.05         8.05       0.27         0       0         -0.14       0         14.92       14.84         20.82       20.31         20.88       20.57         20.87       20.6         20.82       20.41         11.25       11.12         9.9       10.01         8.74       8.62         0.54       0.5         0.26       0.11         0.41       0.07         0.19       0.06         0.55       0.02         0.24       0.02         1.4       0.05         2.22       0         2.8       0         2.13       0         0.83       0.01         0.63       0         0.6       0         0.47       0         0.97       0         0.84       0.01         0.84       0

### Pre Run 3 for 050617

Time	02	CO2	NOX
Time 10:51	23.1	0.03	0.2
10:52	11.01	0.03	0.2
10:52	-0.42	0.00	0.1
10:54	-0.42 -0.66	0.02	0.2
10:55	-0.00	0.02	0.1
10:56	-0.18	0.17	0.1
10:57	-0.19	0.16	0.1
10:58	-0.19 -0.19	0.18	0.1
10:59	8.93	9.11	0.1
11:00	9.82	10.05	0.1
11:01	9.83	10.03	0.1
11:02	9.84	10.13	0.1
11:02	9.84	10.17	0.1
11:04	9.83	10.2	0.1
11:05	9.65 0.55	0.98	18.7
11:06	-0.14	0.33	43.7
11:07	-0.14	0.33	44
11:08	-0.10 -0.17	0.24	44.1
11:09	-0.17	0.24	44.1
11:10	-0.18	0.22	44.2
11:11	-0.17	0.21	41.1
11:12	-0.17	0.23	5
11:13	-0.19	0.19	0.4
11:14	-0.19	0.19	0.3
11:15	-0.13	0.18	0.2
11:16	-0.2	0.18	0.2
11:17	-0.2	0.18	0.3
11:18	-0.2	0.17	0.4
11:19	-0.2	0.17	0.4
11:20	-0.21	0.17	0.3
11:21	-0.21	0.17	0.3
11:22	-0.21	0.17	0.3
11:23	-0.21	0.16	0.3
11:24	-0.2	0.14	0.3
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### Run 3 050617

Time	02	CO2	NOX
13:20	12.53	4.97	27.1
13:21	12.37	5.05	26.5
13:22	12.65	4.93	26.6
13:23	12.79	4.86	26
13:24	13.51	4.54	24.8
13:25	13.61	4.51	22
13:26	13.4	4.61	20.8
13:27	13.16	4.72	20.2
13:28	13.04	4.77	19.1
13:29	12.94	4.83	17.3
13:30	13.17	4.72	16.9
13:31	13.3	4.66	16.5
13:32	13.28	4.67	16.5
13:33	13.55	4.54	16.7
13:34	13.57	4.53	16.7
13:35	13.62	4.51	16.6
13:36	13.07	4.77	16.6
13:37	11.35	5.5	21
13:38	10.96	5.72	23.4
13:39	10.96	5.76	23.2
13:40	10.99	5.73	23.3
13:41	11.01	5.7	23.3
13:42	11.13	5.64	23.7
13:43	11.06	5.7	23.4
13:44	11.02	5.72	23.7
13:45	11.16	5.66	24.2
13:46	11.13	5.63	23.8
13:47	11.1	5.67	23.5
13:48	11.14	5.64	23.8
13:49	11.14	5.64	23.4
13:50	11.48	5.45	23.7
13:51	11.84	5.3	22.6
13:52	11.26	5.63	23.2
13:53	10.68	6.04	24.6
13:54	11	5.71	24.5
13:55	11.08	5.68	23.9
13:56	10.86	5.85	23.8
13:57	11.27	5.58	24.3
13:58	11.31	5.52	23.4
13:59	11.53	5.43	23.7
14:00	11.5	5.45	24.2
14:01	11.38	5.5	24.2
14:02	11.08	5.65	23.8
14:03	11.3	5.54	24.4
14:04	11.19	5.58	24.4
14:05	11.39	5.5	24.1
14:06	11.37	5.5	24.6
14:07	11.36	5.52	24.5
14:08	10.98	5.74	24.2
14:09	* 11.18	5.6	24.7
14:10	11.77	5.35	23
14:11	11.31	5.52	23.9
14:12	11.12	5.6	24.6
14:13	11.38	5.49	24.5

### Run 3 050617

14:14	11.34	5.5	24.6
14:15	11.49	5.45	25.1
14:16	11.35	5.5	24.6
14:17	11.46	5.46	24.4
14:18	11.43	5.48	23.8
14:19	11.31	5.53	24.4
14:20	11.24	5.57	24.3
14:21	11.31	5.53	24.8
14:22	11.12	5.66	24.4
14:23	11.43	5.48	24.3
14:24	11.14	5.63	24.1
14:25	11.5	5.44	24.7
14:26	11.66	5.38	24
14:27	11.45	5.46	24.2
14:28	11.33	5.51	24
14:29	11.22	5.56	24.7
14:30	11.25	5.54	24.6
14:31	11.04	5.72	24.5
14:32	10.9	5.79	25.2
14:33	11.08	5.63	24.9
14:34	11.34	5.5	24.4
14:35	11.33	5.5	24.9
14:36	11.38	5.48	24.2
14:37	11.54	5.41	24.2
14:38	12	5.21	23.6
14:39	11.71	5.35	24.4
14:40	11.36	5.5	25.1
14:41	11.39	5.49	24.8
14:42	11.58	5.39	24.4
14:43	11.87	5.27	24
14:44	11.86	5.28	24.2
14:45	11.75	5.33	24.1
14:46	11.57	5.41	24.4
14:47	11.52	5.43	24.5
14:48	11.47	5.43	24.3
14:49	11.67	5.35	23.9
14:50	11.69	5.35	24.4
14:51	11.79	5.31	24.4
14:52	11.86	5.28	24
14:53	11.66	5.37	24.7
14:54	11.51	5.43	24.7
14:55	11.42	5.46	24.6
14:56	11.47	5.44	24.6
14:57	11.66	5.36	24.4
14:58	11.81	5.3	23.9
14:59	11.77	5.31	24.1
15:00	11.79	5.3	24.5
10.00	11.70	0.0	27.0
Average	11.7	5.4	23.5

### Post Run 3 for 050617

Time	02	CO2	NOX
15:10	11.65	5.35	24.1
15:11	11.47	5.43	24.8
15:12	11.52	5.28	24.8
15:13	0.58	0.55	13.3
15:14	-0.18	0.25	0.3
15:15	-0.19	0.23	0.2
15:16	-0.2	0.21	0.2
15:17	-0.2	0.21	0.1
15:18	5.54	5.99	0.1
15:19	9.79	10.12	0.1
15:20	9.81	10.19	0.1
15:21	9.81	10.26	0.1
15:22	6.19	6.57	1.5
15:23	-0.17	0.37	37.8
15:24	-0.21	0.27	44.4
15:25	-0.22	0.23	44.6
15:26	-0.22	0.21	44.5
15:27	-0.21	0.22	44.6
15:28	-0.24	0.19	10.9
15:29	-0.24	0.18	0.4
15:30	-0.24	0.17	0.3
15:31	-0.24	0.17	0.2
15:32	0.11	0.35	1
15:33	-0.24	0.17	1.2
15:34	-0.24	0.16	0.4
15:35	-0.24	0.16	0.4
15:36	-0.24	0.15	0.3
15:37	-0.24	0.15	0.3



### **CERTIFICATE OF ANALYSIS Grade of Product: EPA Protocol**

**Airgas Specialty Gases** 12722 South Wentworth Avenue Chicago, IL 60628

(773) 785-3000 Fax: (773) 785-1928 Airgas com

Part Number: Cylinder Number:

PGVP Number:

E03NI80E15A0138

XC033319B

ASG - Chicago - IL

Gas Code:

Laboratory:

B12015

CO2,O2,BALN

Reference Number: 54-124499239-2

Cylinder Volume:

150.9 CF Cylinder Pressure: **2015 PSIG** 

Valve Outlet:

590

**Certification Date:** 

Jun 22, 2015

Expiration Date: Jun 22, 2023

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

	ANALYTICAL RESULTS							
Compone	∍nt	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates		
CARBON I	DIOXIDE	10.00 %	10.25 %	G1	+/- 1.0% NIST Traceable	06/22/2015		
OXYGEN		10.00 %	9.850 %	G1	+/- 1.0% NIST Traceable	06/22/2015		
NITROGE	٧	Balance						
Туре	Lot ID	Cylinder No	CALIBRATION Concentration	STANDARDS		Expiration Date		

Туре	Lot ID	Cylinder No	Concentration	Uncertainty	<b>Expiration Date</b>
NTRM	06120402	CC184369	19.66 % CARBON DIOXIDE/NITROGEN	+/- 0.5%	May 01, 2016
NTRM	06120204	CC195893	20.90 % OXYGEN/NITROGEN	+/- 0.4%	Dec 01, 2015
			ANALYTICAL EQUIPMENT		

ANALYTICAL EQUIPMENT					
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration			
CO2-1 HORIBA VIA-510 V1E3H7P5	NDIR	Jun 12, 2015			
O2-1 HORIBA MPA-510 3VUYL9NR	Paramagnetic	Jun 16, 2015			

Triad Data Available Upon Request



Allan Hurain



### **Airgas Specialty Gases**

12722 South Wentworth Avenue Chicago, IL 60628 (773) 785-3000 Fax: (773) 785-1928 www.airgas.com

### **CERTIFICATE OF ANALYSIS Grade of Product: EPA Protocol**

Part Number:

Cylinder Number:

EB0039392

CO2, O2, BALN

ASG - Chicago - IL

Laboratory: PGVP Number:

B12014

Gas Code:

E03NI58E15A02X7

Reference Number: 54-124413494-1

Cylinder Volume:

Cylinder Pressure:

Valve Outlet:

Certification Date:

590

160.6 CF

**2014 PSIG** 

Jan 15, 2014

Expiration Date: Jan 15, 2022

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

		ANALYTICAL	RESULTS		
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	21.00 %	20.61 %	G1	+/- 0.7% NIST Traceable	01/15/2014
OXYGEN	21.00 %	20.95 %	G1	+/- 0.5% NIST Traceable	01/15/2014
NITROGEN	Balance			· v.s /v tvic / tvaccable	01/13/2014

CALIBRATION STANDARDS							
Туре	Lot ID	Cylinder No	Concentration		Uncertainty	<b>Expiration Date</b>	
NTRM	06120405	CC184974	19.66 % CARBON DIOXIDE/	NITROGEN	+/- 0.5%	May 01, 2016	
NTRM	09061411	CC268005	22.53 % OXYGEN/NITROGE	N	+/- 0.4%	Mar 08, 2019	
			ANALYTICAL EQ	UIPMENT			
Instrum	Instrument/Make/Model		Analytical Principle	Last Mul	Last Multipoint Calibration		
CO2-1 HORIBA VIA-510 V1E3H7P5		NDIR	Dec 15, 20	Dec 15, 2013			
O2-1 HORIBA MPA-510 3VUYL9NR		Paramagnetic	Jan 14, 20	Jan 14, 2014			

Triad Data Available Upon Request

Notes:

Approved for Release



### **CERTIFICATE OF ANALYSIS**

### **Grade of Product: EPA Protocol**

**Airgas Specialty Gases** 

12722 South Wentworth Avenue

Chicago, IL 60628

(773) 785-3000 Fax: (773) 785-1928

Airgas.com

Part Number: Cylinder Number: E02NI99E15A0163

CC417042

Reference Number:

54-124488725-1

Laboratory:

ASG - Chicago - IL

Cylinder Volume: 144.3 CF

PGVP Number:

Cylinder Pressure:

**2015 PSIG** 

B12015

Valve Outlet:

660

Gas Code:

NO, NOX, BALN

Certification Date:

Apr 23, 2015

**Expiration Date:** Apr 23, 2018

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS								
Component Requested Actual Protocol Total Relative Assay Concentration Concentration Method Uncertainty Dates								
NOX	45.00 PPM	45.82 PPM	G1	+/- 0.9% NIST Traceable	04/16/2015, 04/23/2015			
NITRIC OXIDE NITROGEN	45.00 PPM Balance	45.82 PPM	G1	+/- 0.9% NIST Traceable	04/16/2015, 04/23/2015			

CALIBRATION STANDARDS							
Туре	Lot ID	Cylinder No	Concentration	Uncertainty	<b>Expiration Date</b>		
NTRM	13061007	CC422721	99.86 PPM NITRIC OXIDE/NITROGEN	+/- 0.8%	Nov 19, 2019		
PRM	12312	680179	10.01 PPM NITROGEN DIOXIDE/NITROGEN	+/- 2.0%	Oct 15, 2014		
GMIS	124206889102	CC320508	4.979 PPM NITROGEN DIOXIDE/NITROGEN	+/- 2.0%	May 04, 2015		
The SRM, F	PRM or RGM noted above	e is only in reference to	the GMIS used in the assay and not part of the analysis.		• .		

ANALYTICAL EQUIPMENT						
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration				
Nexus 470 AEP0000428	FTIR	Apr 16, 2015				
Nexus 470 AEP0000428	FTIR	Арг 16, 2015				

Triad Data Available Upon Request



Approved for Release

Alan Hurain

Page 1 of 54-124488725-1



### **Airgas Specialty Gases**

12722 South Wentworth Avenue Chicago, IL 60628

(773) 785-3000 Fax: (773) 785-1928

www.airgas.com

### **CERTIFICATE OF ANALYSIS Grade of Product: EPA Protocol**

Part Number:

E02NI99E15A3576

Reference Number: 54-124385307-1

Cylinder Number:

CC220278

Cylinder Volume:

144.3 CF

Laboratory:

ASG - Chicago - IL

Cylinder Pressure:

**2015 PSIG** 

PGVP Number:

B12013

Valve Outlet:

660

Gas Code:

NO BALN

Certification Date:

Jul 26, 2013

Expiration Date: Jul 26, 2021

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 pslg, i.e. 0.7 megapascals.

ANALYTICAL RESULTS								
Compo	onent	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates		
NOX		90.00 PPM	91.48 PPM	G1	+/- 1.0% NIST Traceable	07/19/2013, 07/26/2013		
NITRIC	OXIDE	90.00 PPM	91.48 PPM	G1	+/- 1.0% NIST Traceable	07/19/2013, 07/26/2013		
NITROGEN		Balance			_			
CALIBRATION STANDARDS								
Туре	Lot ID	Cylinder No	Concentration		Uncertainty	Expiration Date		
NTRM	11060559	CC332156	101.2 PPM NITRIC OXI	DE/NITROGEN	+/- 0.6%	Feb 16, 2017		

NO2	124206889130	CC323209	4.824 PPM NITROGEN DIC	Oct 25, 2015				
	ANALYTICAL EQUIPMENT							
Instrument/Make/Model			Analytical Principle	Last Multipoint Calibration				
Nexus	470 AEP0000428		FTIR	Jul 21, 2013				

Nexus 470 AEP0000428	FTIR	Jul 21, 2013
170 150000100		1 1 0 1 00 10
Nexus 470 AEP0000428	FTIR	Jul 21, 2013

Triad Data Available Upon Request

Notes:

Approved for Release



### CERTIFICATE OF ANALYSIS

### **Grade of Product: EPA Protocol**

**Airgas Specialty Gases** 

630 United Drive

Durham , NC 27713 919-544-3773 Fax: 919-544-3774

Part Number: Cylinder Number:

Laboratory:

Gas Code:

E02Al99E15A1704

CC504828

PGVP Number:

ASG - Durham - NC

B22016

NO2,BALA

Reference Number:

Cylinder Volume:

122-124532724-1 146.2 Cubic Feet

Cylinder Pressure: Valve Outlet:

**2015 PSIG** 

660

Feb 02, 2016

Certification Date: Expiration Date: Feb 02, 2019

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Collibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume hasis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascats.

ANALYTICAL RESULTS							
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates		
NITROGEN DIOXIDE AIR	50.00 PPM Balance	50.19 PPM	G1	+/- 2.1%	01/18/2016, 02/02/2016		

CALIBRATION STANDARDS						
Туре	Lot ID	Cylinder No	Concentration	Uncertainty	<b>Expiration Date</b>	
GMIS	415201401	CC345255	50,06 PPM NITROGEN DIOXIDE/NITROGEN	+/- 2.0%	Jul 25, 2017	
PRM	12325	APEX1099251	50.00 PPM NITROGEN DIOXIDE/NITROGEN	+/- 2.0%	Jul 26, 2014	
The SRM,	PRM or RGM noted	above is only in reference to	the GMIS used in the assay and not part of the analysis.			

ANALYTICAL EQUIPMENT					
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration			
TECO NO 42CHL-63965-341	Chemiluminescence	Jan 07, 2016			

Triad Data Available Upon Request

Approved for Release

Page 1 of 122-124532724-1

### **Pitot Tube Calibration**

Identificatio Number	on Probe 170 4521 / for cooled
Calibrated	Initials
by	Date 7/5//7
	Initials
	Date

Run Number		"A" Side Calibration		Deviation
Kuir Number	$\Delta P_{std}$	ΔP <sub>s</sub>	$C_{p(s)}$	C <sub>p(s)</sub> – Average C <sub>p</sub>
1	0.69	1,0	0.822	0,005
2	0.68	0,95	0,838	0,010
3	0.69	1.0	0.822	0,005
		Average C <sub>p(s)</sub> (Side A)	0.827	0,0017

Run Number		Deviation		
Kull Number	$\Delta P_{std}$	ΔP <sub>s</sub>	$C_{p(s)}$	C <sub>p(s)</sub> – Average C <sub>p</sub>
1	0.64	0,90	0,835	0,005
2	0.63	0.92	0,819	0,00
3	0.64	0,90	0,835	0.005
	7	Average C <sub>p(s)</sub> (Side B)	0. 830	0,007

$$C_{p(s)} = C_{p(std)} \times \sqrt{\frac{\Delta P_{std}}{\Delta P_s}}$$
  $C_{p(std)} = 0.99$ 

Average Deviation= 
$$\sigma_{(a \text{ or } b)} = \sum_{i=1}^{3} \left( \frac{C_{p(s)} \cdot \overline{C_{p(s)_i}}}{3} \right)$$
 Must be  $\leq 0.01$ 

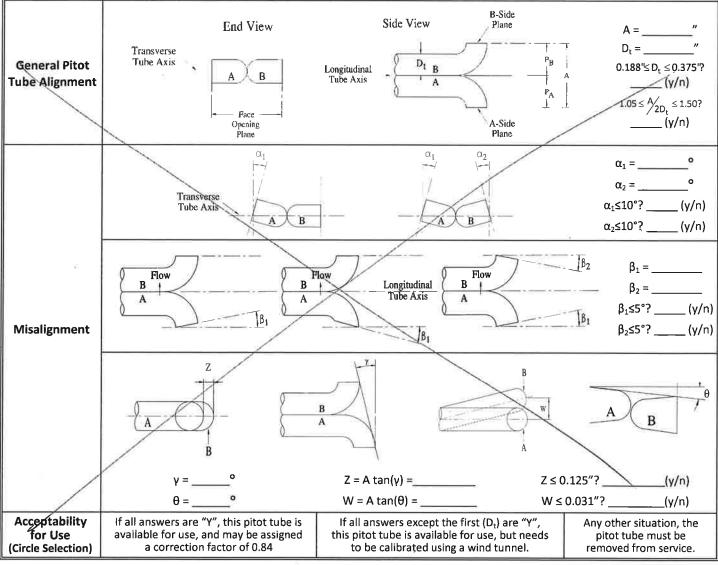
Difference= 
$$\left| \overline{C_{p(s)a}} - \overline{C_{p(s)b}} \right|$$
 Must be  $\leq 0.01$ 

CDS-19; Pitot Tube in a Wind Tunnel
Per EM SOP-007
Issued: February 2017

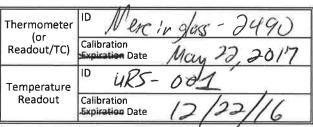
### S-Type Pitot Tube Inspection

Probe ID	704521
Pitot ID	A7566
Caliper ID	NA
Caliper Calibrat Expiration Date	ion





### Stack **Thermocouple** Calibration 1



Calibrated	Initials	7
by	Date	7/5/17
	Initials	7 /
	Date	

		Compare readings	Calculate applicabil	ity range for thermocouple
Reference Thermometer	Thermocouple Readout	$\frac{T_{abs,TC}}{T_{abs,RT}} = \underline{I, b O} 6$	Min <sub>abs</sub> = 0.9 × T <sub>abs,TC</sub>	Min <sub>F</sub> Min <sub>abs</sub> – 460
T <sub>F</sub> _84°F	T <sub>F</sub> <u>87</u> °F	'abs,RT Is this between 0.985	°R	°F
T <sub>abs, RT</sub> <u>544</u> °R <sup>2</sup>	T <sub>abs, TC</sub> <u>547</u> °R	and 1.015?	$Max_{abs} = 1.1 \times T_{abs,TC}$	Max <sub>F</sub> = Max <sub>abs</sub> − 460
		<u> </u>	°R	°F

 $<sup>^1</sup>$  Per SOP 032, this calibration is generally performed at 160°F.  $^2$   $T_{abs;}(^\circ R) = T_F(^\circ F) + 460$ 

CDS-15F: Pitot Tube Inspection, TC Calibration

Per: EM SOP-009 Revised: April 2017

### "A" Side Calibration

Run No.	$\Delta \mathbf{P_{std}}$	$\Delta \mathbf{P_s}$	$C_{p(s)}$	<b>Deviation</b>
1	0.69	1.00	0.822	0.005
2	0.68	0.95	0.838	0.010
3	0.69	1.00	0.822	0.005
		9 <u>—</u>		
		Average [	0.827	0.007

### "B" Side Calibration

Run No.	$\Delta \mathbf{P}_{std}$	$\Delta \mathbf{P_s}$	$C_{p(s)}$	Deviation
1	0.64	0.90	0.835	0.005
2	0.63	0.92	0.819	0.010
3	0.64	0.90	0.835	0.005
			2 1	
		Average II	0 8301	0 007

Average Cp(s) Difference Average  $C_p(A+B)/2$  0.002 0.829

### Acceptance Criteria

Average Deviation (Side A) : Must be  $\leq 0.01$ 

PASS

Average Deviation (Side B) : Must be  $\leq 0.01$ 

PASS

Average  $C_{p(s)}$  Difference : Must be  $\leq 0.01$ 

PASS

	Ref	Pitot	Acceptability
F	84	87	
R	544	547	1.006
1			TRUE
			,

С	Ref	Pitot	Acceptability
C K	273	273	

This spreadsheet is used in conjunction with the data sheets used to inspect and calibrate pitot tubes.

These data sheets are CDS-15 and CDS-15F

### **Pitot Tube Calibration**

Pitot Tube Identificatio Number	on Pro/20 1704522 (fir looked)
Calibrated by	Initials  Date 7/5/17
ja:	Initials Date

Run Number	1	Deviation		
Null Nullibel	$\Delta P_{std}$	ΔP <sub>s</sub>	C <sub>p(s)</sub>	C <sub>p(s)</sub> – Average C <sub>p</sub>
1	0.64	0,90	0.835	0,007
2	0,63	0.93	0.815	0.013
3	0,64	0.90	0.835	0.007
		Average C <sub>p(s)</sub> (Side A)	0.828	0.0089

Run Number		Deviation		
Kurriumber	$\Delta P_{std}$	ΔP <sub>s</sub>	C <sub>p(s)</sub>	C <sub>p(s)</sub> – Average C <sub>p</sub>
1	0.64	0.98	0.835	0,027
2	0.63	0.90	0,823	0,0
3	0.64	0,93	0.821	0,007
4		Average C <sub>p(s)</sub> (Side B)	0. 828	0,005

$$C_{p(s)} = C_{p(std)} \times \sqrt{\frac{\Delta P_{std}}{\Delta P_{s}}}$$
  $C_{p(std)} = 0.99$ 

Average Deviation= 
$$\sigma_{(a \text{ or } b)} = \sum_{i=1}^{3} \left( \frac{C_{p(s)} \cdot \overline{C_{p(s)_i}}}{3} \right)$$
 Must be  $\leq 0.01$ 

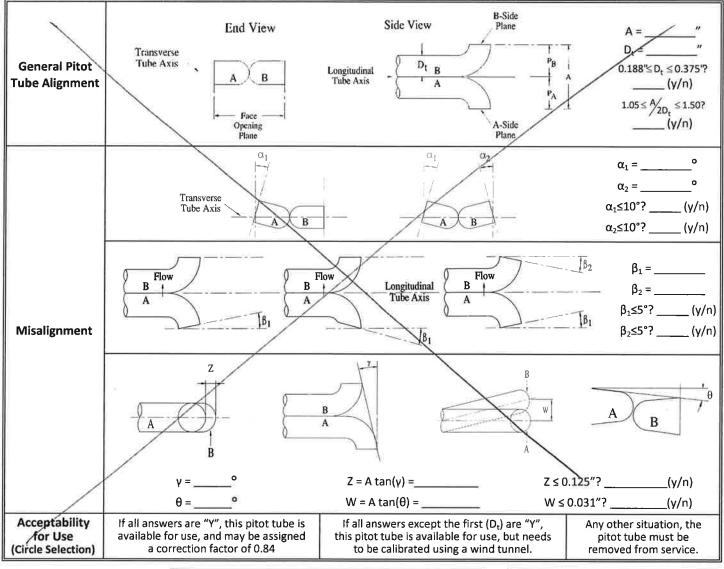
Difference= 
$$|\overline{C_{p(s)a}} - \overline{C_{p(s)b}}|$$
 Must be  $\leq 0.01$ 

CDS-19; Pitot Tube in a Wind Tunnel
Per EM SOP-007
Issued: February 2017

### S-Type Pitot Tube Inspection

Probe ID	1704522
Pitot ID	A7567
Caliper ID	NA
Caliper Calibra Expiration Date	

Calibrated	Initials	JC
by	Date	7/5/17
	Initials	, , ,
	Date	



### Stack Thermocouple Calibration <sup>1</sup>



Calibrated	Initials
by	Date 7/5/17
į.	Initials 7
	Date

		Compare readings	Calculate applicability range for thermocouple	$\overline{}$
Reference Thermometer	Thermocouple Readout	$\frac{T_{abs,TC}}{T} = 1.007$	$Min_{abs} = 0.9 \times T_{abs, TC}$ $Min_F = Min_{abs} - 460$	
T <sub>F</sub> 84°F	T <sub>F</sub> 88 °F	T <sub>abs,RT</sub>	°F	
T <sub>abs, RT</sub> 544 °R 2		and 1.015?	$Max_{abs} = 1.1 \times T_{abs,TC}$ $Max_F = Max_{abs} - 460$	
		<u> </u>	°R°F	

 $<sup>\</sup>stackrel{1}{\ \ }$  Per SOP 032, this calibration is generally performed at 160°F.

 $^{2}$  T<sub>abs;</sub> (°R) = T<sub>F</sub> (°F) + 460

CDS-15F: Pitot Tube Inspection, TC Calibration

Per: EM SOP-009 Revised: April 2017

### "A" Side Calibration

Run No.	$\Delta {f P}_{\sf std}$	$\Delta P_s$	$C_{p(s)}$	<b>Deviation</b>
1	0.64	0.90	0.835	0.0067
2	0.63	0.93	0.815	0.0133
3	0.64	0.90	0.835	0.0067
11.7				
		Average	0.828	0.0089

### "B" Side Calibration

Run No.	$\Delta \mathbf{P_{std}}$	$\Delta P_s$	$C_{p(s)}$	<b>Deviation</b>				
1 [	0.64	0.90	0.835	0.007				
2	0.63	0.90	0.828	0.000				
3	0.64	0.93	0.821	0.007				
		=						
		Average [	0.828	0.005				

Average Cp(s) Difference Average  $C_p(A+B)/2$  0.000

### Acceptance Criteria

Average Deviation (Side A) : Must be  $\leq 0.01$ Average Deviation (Side B) : Must be  $\leq 0.01$ PASS

Average  $C_{p(s)}$  Difference : Must be  $\leq 0.01$ 

PASS

	Ref	Pitot	Acceptability
F	84	88	€) (V = 00)
R	544	548	1.007
			TRUE

С	Ref	Pitot	Acceptability
C K	273	273	

This spreadsheet is used in conjunction with the data sheets used to inspect and calibrate pitot tubes.

These data sheets are CDS-15 and CDS-15F

# 5 Point Secondary Standard Dry Gas Meter Calibration

DGM ID URS-001

Calibrated by Initials CS
Date 12/20/16
Reviewed by Date

			Run 5C																					
IX-73	29.12	0.8042	Run 5B	3.65	192.022	202,915	10.893	74		74		74.0	10	29.66	89	14.5	10.677	10.380	1.068	0.972	0.972	1.945	1.945	
			Run 5A	3.65	181.133	192.022	10.889	73		74		73.5	10	29.66	89	14.5	10.683	10.380	1.068	0.972		1.944		
			Run 4C																					
IX-63	21.18	0.5840	Run 4B	2	210.944	218.987	8.043	74		74		74.0	10	29.66	89	17	7.883	7.538	0.788	0.956	0.957	2.021	2.021	
			Run 4A	2	202.915	210.944	8.029	74		74		74.0	10	29.66	89	17	7.870	7.538	0.787	0.958		2.021		
			Run 3C																					
IX-55	16.56	0.4564	Run 3B	1.2	174.305	181.133	6.828	73		73		73.0	11	29.66	89	17	6.705	6.480	0.610	996.0	0.969	1.982	1.977	
			Run 3A	1.2	157.010	163.177	6.167	71		72		71.5	10	29.66	29	17	6.073	5.897	0.607	0.971		1.973		
				Run 2C																				
IX-48	12.58	0.3467	Run 2B	0.7	224.615	230.215	2.600	73		74		73.5	12	59,66	89	17	5.494	5.370	0.458	0.977	0.975	2.006	2.006	
			Run 2A	0.7	218.987	224.615	5.628	74		73		73.5	12	29.66	89	17	5.522	5.370	0.460	0.973		5.006		
			Run 1C																					
IX-40	8.64	0.2378	Run 1B	0.35	168.586	174.305	5.719	72		23		72.5	18	59.66	89	17	5.621	5.525	0.312	0.983	0.982	2.128	2.128	
			Run 1A	0.35	163.177	168.586	5.409	73		72		72.5	17	29.66	89	17	5.317	5.218	0.313	0.981		2.128		
Orifice ID:	Nominal Orifice Flow Rate (cfm or L/m)	Orifice K':	Dry Gas Meter	Delta H	Initial Reading, (ft³)	Final Reading, (ft³)	Difference, (ft³)	Initial Meter Inlet Temp., (°F)	Initial Meter Outlet Temp., (°F)	Final Meter Inlet Temp., (°F)	Final Meter Outlet Temp., (°F)	Average Meter Temp., (°F)	Test Time (min.)	Barometric Pressure, ("Hg)	Ambient Temperature, (°F)	Pump Vacuum, ("Hg)	Standard Volume of the Meter, (V <sub>mstd</sub> )	Standard Volume of Critical Orifice, (V <sub>crstd</sub> )	Flow Rate (cfm or L/m)	DGM Calibration Factor, (Y)	Average DGM Calibrat on Factor (Y)	Delta H@	Average Delta H@	

0.9/1	TRUE	2.015	TRUE	
Current Average Y =	All Individual Values within 2% of mean?	Current Delta ⊣@ =	All Individual Values within 0.2 of mean?	

CDS-04S DGM 5 point against orifice Per EM SOP-002 Revision Date: May 2012

## Pre/Post Test Console Calibration Check

Console ID	4115-	700
Calibrated by	Initials	WCT
כמווטו מרכת חל	Date	5/13/17
lyd bowoing d	Initials	
Neviewed by	Date	

IX-63	0.5840	Run #3p	748.813	755.156	6.343	9/		9/		0.92	<b>&amp;</b>	1.95	28.99	02	18	6.082	5.883	0.967	-0.004	1.95
Ä	0.5	Run #3a	742.495	748.813	6.318	75		9/		75.5	80	1.95	28.99	70	18	6.063	5.883	0.970	-0.001	1.96
IX-55	0.4564	Run #2b	736.322	742.495	6.173	75		75		75.0	10	1.20	28.99	70	20	5.918	5.747	0.971	0.000	1.97
×	0.4	Run #2a	730.162	736.322	6.160	74		74		74.0	10	1.20	28.99	70	20	5.917	5.747	0.971	0.000	1.97
IX-48	0.3467	Run #1b	724.563	730.162	5.599	72	H	73		72.5	12	89.0	28.99	0/	21	5.386	5.239	0.973	0.002	1.93
ΧI	0.3	Run #1a	718.980	724.563	5.583	0/		72		71.0	12	89'0	28.99	0/	21	5.386	5.239	0.973	0.002	1.94
Orifice ID:	Orifice K':	Dry Gas Meter	Initial Reading, (ft³)	Final Reading, (ft³)	Difference, (ft³)	Initial Meter Inlet Temp., (°F)	Initial Meter Outlet Temp., (°F)	Final Meter Inlet Temp., (°F)	Final Meter Outlet Temp., (°F)	Average Meter Temp., (°F)	Test Time (min.)	Orifice Manometer Reading, ("H <sub>2</sub> O)	Barometric Pressure, ("Hg)	Ambient Temperature, (°F)	Pump Vacuum, ("Hg)	Standard Volume of the Meter, (Vmstd)	Standard Volume of Critical Orifice, (Vcrstd)	DGM Calibration Factor, (Y)	Difference from Average	Delta H@

_	_	_	_	_	1
0.971	0.971	0.0	TRUE	1.954	
Average Y =	Reference Yd =	Percent Difference =	Is Measured Y within 5% of Reference Yd?	Average Delta H@ =	

CDS-0453 DGM 3 point cal check against orifice Per EM SOP-002

### Temperature Readout Calibration Isokinetic Sampling Consoles (using a Simulated Thermometer)

readout in indiline. 0v2-001	Readout	ID	Number	URS-001
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Reference Thermometer	ID Number	2391
memionietei	Calibration Exp Date	4/4/2017
Reference	ID Number	SR2
Thermocouple	Calibration Exp Date	_1/3/2017
Thermometer Simulator	ID Number	T-311348
Simulator	Calibration Exp Date	3/31/2017

Calibrated by: <u>CS</u>
Date <u>12/22/16</u>
Reviewed by WCT
Date12/22/16

Temperature Readout Calibration
Reference Thermometer (°F) 63
Temperature Readout (°F) _62
Was Readout adjusted? Y/N
Do these agree within 2°F Y/N

### **Temperature Readout Linearity Check**

Channel		emperature (°		Channel	Te	emperature (°F	:)
	Theoretical	Observed	Difference <sup>1</sup>		Theoretical	Observed	Difference
	0	2	+2		-25	-22	+3
	50	50	0		0	2	+2
	100	100	0	4 EXIT	50	50	0
	250	252	+2		100	100	0
1	350	351	+1		150	149	<b>-1</b>
STACK	500	499	-1		-25	-22	+3
	750	751	+1		0	2	+2
	1000	1001	+1	5 AUX	50	50	0
	1500	1499	-1		100	100	0
	1900	1899	-1		150	149	<b>=1</b>
	0	2	+2		-25		
	50	50	0		0		
2 PROBE	100	100	0	6	50		
	250	252	+2		100		
	350	351	+1		150		
	0	2	+2		-25		
	50	50	0		0		
3 FILTER	100	100	0	7	50		
	250	252	+2		100		
	350	351	+1		150		

# 5 Point Secondary Standard Dry Gas Meter Calibration

### DGM ID URS 005

alibrated	JRE
ρ	12/23/16
Reviewed	
ģ	

Orifice ID:	IX-40	IX-48	IX-55	IX-63	IX-73
Nominal Orifice Flow Rate (cfm or L/m)	8.64	12.58	16.56	21.18	29.12
Orifice K':	0.2378	0.3467	0.4564	0.5840	0.8042
Dry Gas Meter	Run 1	Run 2	Run 3	Run 4	Run 5
Delta H	0.32	0.67	1.1	1.8	3.4
Initial Reading, (ft³)	865.270	868.699	873.302	879.503	887.405
Final Reading, (पि <sup>3</sup> )	868.431	873.217	879.381	887.268	898.005
Difference, (ft³)	3.161	4.518	6.079	7.765	10.600
Initial Meter Inlet Temp., (°F)	61	63	64	65	99
Initial Meter Outlet Temp., (°F)	63	64	9	99	29
Final Meter Inlet Temp., (°F)	61	63	64	65	99
Final Meter Outlet Temp., (°F)	63	64	65	99	29
Average Meter Temp., (°F)	62.0	63.5	64.5	65.5	66.5
Test Time (min.)	10	10	10	10	10
Barometric Pressure, ("Hg)	29.00	29.00	29.00	29.00	29.00
Ambient Temperature, (°F)	64	64	9	65	99
Pump Vacuum, ("Hg)	15	15	15	15	15
Standard Volume of the Meter, (V <sub>mstd</sub> )	3.099	4.417	5.931	7.562	10.303
Standard Volume of Critical Orifice, (V <sub>crstd</sub> )	3.013	4.392	5.776	7.391	10.169
Flow Rate (cfm or L/m)	0.310	0.442	0.593	0.756	1.030
DGM Calibration Factor, (Υ)	0.972	0.994	0.974	0.977	0.987
Average DGM Calibration Factor (Y)	0.972	0.994	0.974	0.977	0.987
Delta H@	2.025	2.000	1.902	1.904	1.904
Average Delta H@	2.025	2.000	1.902	1.904	1.904

Current Average Y =	0.981
All Individual Values within 2% of mean?	TRUE
Current Delta H@ =	1.947
All Individual Values within 0.2 of mean?	TRUE

CDS-045 DGM 5 point against orifice Per EM SOP-002 Revision Date: May

## Pre/Post Test Console Calibration Check

URS-005	WCT	5/13/17		
URS-	Initials	Date	Initials	Date
Console ID	Calibrated by	כמווסומבת כא	Downoing Day	Neviewed by

55 IX-63 64 0.5840	340	Run #3b	112.777	119.024	6.247	73		74		73.5	8	1.80	28.99	70	20	6.015	5.883	0.978	0.002	1.81
	Run #3a	106.545	112.777	6.232	72		73		72.5	8	1.80	28.99	70	20	6.012	5.883	0.979	0.002	1.82	
	Run #2b	100.460	106.545	6.085	20		72		71.0	10	1.05	28.99	20	20	5.876	5.747	0.978	0.002	1.73	
55-XI	0.4564	Run #2a	94.375	100.460	6.085	69		20		69.5	10	1.05	28.99	20	20	5.892	5.747	0.975	-0.001	1.74
IX-48	0.3467	Run #1b	88.835	94.375	5.540	29		68		67.5	12	0.58	28.99	02	20	5.379	5.239	0.974	-0.002	1.66
ΧI	0.3	Run #1a	83.310	88.835	5.525	99		29		66.5	12	85.0	28.99	02	20	5.374	5.239	0.975	-0.002	1.67
Orifice ID:	Orifice K':	Dry Gas Meter	Initial Reading, (ft³)	Final Reading, (ft³)	Difference, (ft³)	Initial Meter Inlet Temp., (°F)	Initial Meter Outlet Temp., (°F)	Final Meter Inlet Temp., (°F)	Final Meter Outlet Temp., (°F)	Average Meter Temp., (°F)	Test Time (min.)	Orifice Manometer Reading, ("H <sub>2</sub> O)	Barometric Pressure, ("Hg)	Ambient Temperature, (°F)	Pump Vacuum, ("Hg)	Standard Volume of the Meter, (Vmstd)	Standard Volume of Critical Orifice, (Vcrstd)	DGM Calibration Factor, (Y)	Difference from Average	Delta H@

Average Y =	926.0
Reference Yd =	0.981
Percent Difference =	-0.5
Is Measured Y within 5% of Reference Yd?	TRUE
Average Delta H@ =	1.738

CDS-0451 DGM 3 point cal check against orifice Per EM SOP-002 Revision Date: May 2012

### Temperature Readout Calibration Isokinetic Sampling Consoles (using a Simulated Thermometer)

Readout ID Number	URS-005
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Reference Thermometer	ID Number <u>2391</u>
	Calibration Exp Date _4/4/2017
Reference Thermocouple	ID NumberSR2
тистинособріє	Calibration Exp Date _1/3/2017
Thermometer Simulator	ID Number <u>T-311348</u>
Jiii dia coi	Calibration Exp Date 3/31/2017

Calibrated by: <u>CS</u>
Date <u>12/22/16</u>
Reviewed byWCT
Date12/22/16

Temperature Readout Calibration						
Reference Thermometer (°F) 63						
Temperature Readout (°F) _62						
Was Readout adjusted? Y/N						
Do these agree within 2°F Y/N						

### **Temperature Readout Linearity Check**

Channel	Т	emperature (°		T	Channel	Temperature (°F)			
Chaintei	Theoretical	Observed	Difference 1			Theoretical	Observed	Difference	
	0	3	+3			-25	-22	+3	
	50	51	+1			0	3	+3	
	100	101	+1		4 EXIT	50	51	+1	
	250	253	+3			100	101	+1	
1	350	353	+3			150	150	0	
STACK	500	500	0			-25	-22	+3	
	750	752	+2			0	3	+3	
	1000	1002	+2		5 AUX	50	51	+1	
	1500	1501	+1			100	101	+1	
	1900	1901	+1			150	150	0	
	0	3	+3			-25			
	50	51	+1			0			
2 PROBE	100	101	+1		6	50			
	250	253	+3			100			
	350	353	+3			150			
	0	3	+3			-25			
	50	51	+1			0			
3 FILTER	100	101	+1		7	50			
	250	253	+3			100		2:	
	350	353	+3			150			

Difference is calculated as follows: Difference = Observed - Theoretical

CDS-31: Temperature Readout

Per: EM SOP-001 Revised: April 2016